



Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan



May 15, 2009

Department of
Land & Water
Resources



This document was funded in part by an urban forestry grant from the State of Wisconsin Department of Natural Resources Forestry Program as authorized under s. 23.097, Wis. Stat.

Executive Summary

This plan was developed by the Dane County Land and Water Resources Department-Parks Division, with partnership and valuable assistance from the Wisconsin Department of Natural Resources, Wisconsin Department of Agriculture Trade and Consumer Protection, Dane County Tree Board, and Dane County Public Works-Solid Waste Division. Feedback provided by local units of government, individuals in other agencies, and Dane County residents was also critical to the formulation of this plan. With proactive preparation as its guiding philosophy, this plan endeavors to make the arrival of the emerald ash borer (EAB) in Dane County manageable for the County's residents, local officials, and municipal governments. The plan seeks to transform the challenges posed by the EAB into an opportunity to rethink and restructure how urban "waste" wood is dealt with. Three main goals guided the development of Dane County's Emerald Ash Borer and Wood Utilization Strategic Management Plan. This plan aims to 1) reduce the environmental impacts of the EAB within Dane County, 2) mitigate the potential economic and social costs associated with emerald ash borer control efforts and damage, and 3) find ways to put wood formerly considered "waste" to positive and profitable use.

Our research indicates that Dane County municipalities, alone or in cooperation with private sector partners, are well positioned to handle the expected increase in wood volumes that the EAB is likely to bring **if they take the proactive preparatory steps outlined in this plan**. In cases of unpredictable surges in wood volume, whether caused by infestation or by storm damage, there may be a role for the County to play in coordinating a Wood Utilization Program that is able to mitigate the costs associated with tree removal, hauling, and processing by taking advantage of an economy of scale. The County plans to move forward in this area to explore and generate value-added markets for wood residue products. Dane County is also currently exploring options for public incentive programs and partnerships that may be able to help offset the costs associated with removing and replacing ash trees on Dane County residents' private property.

This plan consolidates essential information within one accessible, useable reference document. In order to empower communities to prepare for the EAB, this plan offers a brief historical background of the EAB in North America and provides an illustrated guide to the information and education necessary for proactive management and local monitoring to take place. Once the EAB reaches south-central Wisconsin, Dane County residents, local officials, and municipal governments can look to this plan for a clear outline of options for EAB control and containment. Since an increased volume of wood residue will be among the EAB's most significant effects, this plan also outlines various options for dealing with wood residue in an economically and environmentally sound manner.

The understanding of EAB management is constantly expanding as managers gain experience dealing with this invasive beetle and as new research is conducted. Accordingly, this plan will be updated on an as-needed basis. As well, this plan sets the stage for continued research surrounding wood utilization options and strategies. Dane County intends the collaborative partnerships that developed over the course of the planning process to continue.

Graphic Summary of Plan Recommendations

Local

County

State

EAB Preparedness Actions

Community Education and Outreach
 Continuous Monitoring
 Conduct Municipal Tree Inventory
 Stop Planting Ash Trees
 Consider Removing "Sub-Prime" Ash Now
Develop a Municipal EAB Response Plan
 Do Not Move Firewood
 Consider Local Ordinances to Prevent Spread

The Dane County
 Emerald Ash Borer
 and Wood Utilization
 Strategic Management
 Plan

Wisconsin EAB Response Plan
 Toolkit for Wisconsin Communities
 Monitoring and Public Education

EAB Discovered in Dane County

Confirmation, Notification, and Mobilization

Municipality Notified of Confirmation
 → Municipal EAB Response Plan

County Notified of Confirmation
 Assess Need for County Wood Utilization Program

ICS System
 Quarantines
 Delimiting Survey
 Action Plan

Control and Containment
 Consideration of Options
 Insecticides
 Ash Reduction
 Sink Trees

Tree Removals Conducted
 by Municipalities and Tree
 Care Professionals

Develop Municipal Wood Utilization Yards
 Explore Value-added Uses for Ash
 Be Prepared to Meet Quarantine Regulations

Wood Utilization

Dane County Wood Utilization Program
 Manage Large Volumes of Wood Residue from Multiple Communities
 Develop Value-Added Markets for Wood Residue Products

Post-EAB Reforestation

Acknowledgements

This plan is made possible by an Urban Forestry Grant from the Wisconsin Department of Natural Resources. The Wisconsin Department of Natural Resources (DNR), Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP), Dane County Tree Board, Dane County Public Works-Solid Waste Division, and municipal government entities within Dane County have been key partners in the planning process. The Dane County Land and Water Resources Department-Parks Division is grateful for the input of numerous Dane County residents and local officials. The following groups and individuals were instrumental in the development of this plan:

Dane County Executive's Office

Kathleen Falk, Dane County Executive

Environment, Agriculture, and Natural Resources Committee

Kyle Richmond (Chair), Patrick Downing, Chuck Erickson, Ronn Ferrell, Duane Gau, Wyndham Manning, Bob Salov

Dane County Park Commission

William Lunney (Chair), Tom Dawson, Christine Haag, John Hutchinson, Jeff Kostelic (County Board Supervisor), Dave Ripp (County Board Supervisor), Tom Thoresen

Dane County Land and Water Resources Department

Kevin Connors, Director

Pete Jopke, Water Resources Planner

Darren Marsh, Parks Director

Michelle Richardson, GIS Analyst

Anna Willow, LTE Invasive Species Planner

Dane County Tree Board

Marla Eddy, Tree Board Chair

Jeff Olson, Tree Board Member

Wisconsin Department of Agriculture, Trade and Consumer Protection

Bob Dahl, Regulatory Supervisor

Mick Skwarok, Plant Pest Assessment and Outreach Specialist

Wisconsin Department of Natural Resources

Terry Mace, Forest Resource Analyst

Jeff Roe, Regional Urban Forestry Coordinator

United States Forest Service Forest Products Laboratory

John (Rusty) Dramm, Forest Products Specialist

Contents

Executive Summary	ii
Graphic Summary of Plan Recommendations.....	iii
Acknowledgements	iv
Contents.....	v
Introduction	1
Scope	1
Planning Process.....	2
Goals, Priorities, and Actions	3
Historical Background.....	6
EAB Planning Efforts in Wisconsin	7
EAB Management Precedents.....	10
Plan Recommendations	12
First Steps: Immediate Management Actions	12
EAB Planning for Municipalities.....	12
EAB Planning for Homeowners	14
Education and Outreach Efforts.....	15
Monitoring Efforts	16
EAB Confirmation, Notification, and Mobilization.....	22
Funding for EAB Management.....	25
EAB Management in Dane County Public-Use Areas.....	26
Control Methods	27
Insecticides	28
Ash Reduction	29
Sink Trees: Attract and Remove.....	31
Biological Control (No Practical Means)	33
Eradication (Special Situations Only).....	33
No Action (Not Recommended).....	34
Local EAB Control Ordinances	34
Wood Utilization Options	35
Option 1: No Change.....	38
Option 2: Independent Wood Utilization.....	38
Option 3: The Dane County Wood Utilization Program	40
Materials and Handling Procedures.....	41
Wood Utilization Yards.....	42
Dane County Tree and Ash Density	45
Value-Added Options for Wood Utilization.....	57
Post EAB Reforestation Efforts	59
Next Steps.....	61
Appendix A: References and Sources for Additional Information	62
Appendix B: Glossary	64
Appendix C: Federal and State Regulations Providing Authority to Control EAB	65
Appendix D: Local Ordinance Provisions & Policies for EAB	74
Appendix E: Certified Arborists Serving Dane County	78
Appendix F: South-Central Wisconsin Hardwood Processors.....	80
Appendix G: Chipper and Grinder Manufacturers.....	82
Appendix H: Template for EAB Doorhanger.....	83
Appendix I: Letter to Municipalities	85
Appendix J: Dane County Contacts for Urban Forestry Issues.....	87

List of Figures

Figure 1: Ash in Decline.....	3
Figure 2: EAB Damage.....	4
Figure 3: The EAB's Native Range.....	6
Figure 4: EAB Detection Tree.....	8
Figure 5: EAB Purple Panel Tree.....	9
Figure 6: EAB Detection Efforts in Dane County, 2004-2008.....	9
Figure 7: Opposite Branching and Budding.....	16
Figure 8: Compound Leaflet.....	16
Figure 9: Ash Bark-Diamond-shaped Ridges.....	17
Figure 10: Ash-Seed-Oar-shaped Samaras.....	17
Figure 11: Epicormic Sprouting.....	18
Figure 12: Branch Dieback and Discoloration.....	19
Figure 13: D-shaped Exit Holes.....	20
Figure 14: Vertical Bark Splits.....	20
Figure 15: Woodpecker Activity.....	20
Figure 16: Adult EAB.....	21
Figure 17: Adult EAB.....	21
Figure 18: S-shaped Galleries.....	21
Figure 19: EAB Larvae.....	21
Figure 20: Actions Following EAB Confirmation.....	23
Figure 21: Trunk Injection of Insecticide.....	29
Figure 22: Summary of Control and Containment Recommendations.....	32
Figure 23: Logging Arch.....	40
Figure 24: "The Wheeler" Logging Trailer.....	39
Figure 25: Removed Ash Stacked for Utilization.....	45
Figure 26: County-owned Landscape Trees and Ash.....	47
Figure 27: Municipal Tree Inventory Data.....	50
Figure 28: Dane County Land Cover.....	53
Figure 29: Map of Possible Wood Utilization Sites.....	56
Figure 30: Ash Lumber, with Ash Borer Damage.....	58
Figure 31: Red Maple (<i>Acer rubrum</i>).....	59
Figure 32: Ginko (<i>Ginkgo biloba</i>).....	60
Figure 33: Honey Locust (<i>Gleditsia triacantho</i>).....	60
Figure 34: Pin Oak (<i>Quercus palustris</i>).....	60

List of Tables

Table 1: County-owned Landscape Trees and Ash, by Location.....	46
Table 2: Municipal Tree Inventory Data.....	48
Table 3: Estimated Trees and Ash in Dane County Woodlands.....	51
Table 4: Estimated Trees and Ash in Dane County Residential Areas.....	54

Introduction

In August of 2008, the EAB was confirmed in Wisconsin for the first time when an established infestation was found in Ozaukee and Washington Counties in the southeastern part of the state. The beetle continues its spread. On April 6, 2009 EAB was confirmed in Vernon County, located on the western edge of the state along the Mississippi River. While control and containment efforts may slow the spread of this invasive beetle, it now seems highly likely that Dane County residents and local officials will be dealing with the local impacts of the EAB in the near future. Every native ash tree is susceptible to EAB infestation and mortality. Dane County estimates that the cost to remove and replace the ash located within its own public-use areas may approach \$700,000. The economic impacts of EAB are also certain to be significant for municipalities and private property owners. Assuming the spread of the EAB into Wisconsin continues the pattern it has taken in Illinois, we can expect the EAB to be present throughout Dane County within five years. In response, the Land and Water Resources Department-Parks Division has developed a strategic plan to guide Dane County's approach to EAB management and highlight emerging wood utilization opportunities. While this plan can provide direction to Dane County residents, municipalities, and local officials, it is not a mandate.

This plan provides a concise overview of the history of the EAB in North America, including background on Wisconsin's proactive EAB management efforts and the lessons communities in other states have taken from their experience with the EAB. The plan outlines immediate steps communities and residents can take to prepare for the EAB's arrival. Because public education and local monitoring are critical elements of proactive management, information on ash tree identification, the signs and symptoms of EAB, and EAB identification are included. This plan provides guidance on steps to take once a confirmed EAB detection occurs, summarizes EAB control and containment options, and describes potential wood utilization options for EAB affected trees. Appendices to the plan catalog sources to consult for additional information, federal and state EAB control regulations, and local ordinances for the management of EAB. Directories of certified arborists and wood users in Dane County and the surrounding area can also be found in these appendices.

Scope

Wisconsin's Departments of Natural Resources (DNR) and Agriculture Trade and Consumer Protection (DATCP) have invested a great deal of time and resources in planning for the arrival of the emerald ash borer (EAB) in our state. *The Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan* is intended to complement these state-level planning efforts. This county-level plan intends to empower municipal governments and private land owners in Dane County to take full advantage of the State Plan and its resources. The County Plan includes local data on ash tree numbers and locations, local sites and options for wood utilization, and local contacts for certified arborists and wood processors in the region (see Appendices E and F), along with other useful information specific to Dane County. The County recognizes that some municipalities within Dane County have initiated their own EAB response plans and

applauds these efforts. Proactive preparation at the municipal level will be vital to successfully managing the EAB and its effects.

Planning Process

In January of 2008, the Dane County Land and Water Resources Department-Parks Division was awarded an Urban Forestry Grant from the Wisconsin Department of Natural Resources to develop a county-level emerald ash borer response plan. The development of this plan included several components:

- As part of the planning process, Dane County updated its tree inventory database. With a primary focus on developed areas within the County Parks, Geographic Positioning System (GPS) locations were acquired for County-owned landscape trees and are now stored in Geographic Information System (GIS) format.
- Letters were sent to all sixty-one local units of government within Dane County requesting municipal tree inventories and information about municipal wood residue utilization. Available tree inventory data were analyzed using GIS. In addition to developing a countywide GIS layer, it is hoped that this process will encourage local units of government to develop or update their own tree inventories. As well, ongoing investigation by the Dane County Land Information Office and the City of Fitchburg may demonstrate the potential use of infrared aerial imagery for the identification of privately-owned and woodland ash trees.
- Various wood utilization options were researched and outlined as part of this plan. Baseline criteria were established for the selection of potential Wood Utilization Yards capable of serving as collection and processing sites for EAB affected and other wood residue. Tree inventory data were analyzed to obtain an estimate of the total number and percentage of ash in various parts of Dane County in order to determine where the greatest need for Wood Utilization Yards is likely to exist.
- *The Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan* was drafted by Dane County Land and Water Resources Department-Parks Division personnel and reviewed by the Dane County Tree Board, Wisconsin Department of Natural Resources (DNR), and Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP).
- In addition, a number of important relationships were established between Dane County, USDA Forest Products Laboratory, and wood processors in south-central Wisconsin. These contacts are likely to remain critical as Dane County moves forward in its exploration of wood utilization opportunities. In the near future, Dane County hopes to pursue external funding to establish an experimental Wood Utilization Yard. Using County lands and partnering with DATCP, DNR, the University of Wisconsin, and Forest Products Laboratory, this investigational demonstration project will facilitate inquiry into the feasibility and economics of the wood utilization opportunities outlined in this plan.

Goals, Priorities, and Actions

Goals

The purpose of this plan is to offer Dane County residents, municipalities, and local officials the tools needed to meet the challenges posed by the EAB in a constructive and economical manner. It is intended to be a relevant resource for all residents and communities within Dane County. *The Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan* was developed with the following guiding goals in mind. The plan will:

1. Reduce the environmental impacts of the EAB within Dane County.
2. Mitigate the potential economic and social costs associated with emerald ash borer control efforts and damage.
3. Find ways to put wood formerly considered “waste” to positive and profitable use.

Dane County considers this plan an ongoing process and the continued participation of all Dane County municipalities will ensure that this plan is applicable into the foreseeable future.



Figure 1: Ash in Decline (Photo: Joseph O'Brien, USDA Forest Service)

Priorities and Actions

The plan takes as its foremost priority the reduction of the EAB’s detrimental effects within Dane County and recognizes that environmental, social, and economic impacts may overlap in significant ways. While the most immediate priority of this plan is preparation for the probable arrival of the emerald ash borer in Dane County, the plan also looks beyond this critical current issue to facilitate a new way of thinking about our communities’ reclaimable wood in the years to come.

Following from the goals listed above, the following specific priorities and actions will guide Dane County’s decision-making with respect to EAB management and associated issues.

Goal #1:**Reduce the environmental impacts of the EAB within Dane County.****Priorities:**

- Prevent and/or delay the arrival of the EAB in Dane County.
- Endorse appropriate and up-to-date EAB management options.
- Encourage wood utilization practices that avoid spreading the EAB within Dane County.
- Cultivate Dane County residents' awareness and knowledge of the EAB and other invasive pests and their damaging effects.

Proposed Actions:

- Stay current regarding EAB research and management recommendations and ensure that this information is communicated to Dane County municipalities, local officials, and residents.
- Encourage and facilitate public education on how the EAB is spread, in partnership with DATCP, DNR, and the Dane County Tree Board.
- Empower citizens to monitor for EAB in their own communities.
- Provide municipalities with tools and ideas for developing municipal EAB control ordinances.
- Enforce Dane County Ordinance Amendment 32, which prohibits firewood originating from over fifty miles away or out of state from Dane County parks and campgrounds.
- Identify potential Wood Utilization Yard sites throughout the County in order to minimize hauling distances and ensure communities' access to storage and utilization opportunities for EAB affected wood.



Figure 2: EAB Damage (Photo: Joseph O'Brien, USDA Forest Service)

Goal #2:**Mitigate the potential economic and social costs associated with emerald ash borer control efforts and damage.****Priorities:**

- Strongly encourage Dane County municipalities to develop their own tree inventories and local EAB response plans.
- Offer guidance and recommendations to Dane County municipal officials that facilitate the development of local tree inventories and support local EAB planning.
- Identify potential Wood Utilization Yard sites within Dane County that can be used in cases of unpredicted volumes of wood residue that are unmanageable at the local level and/or span multiple municipalities.

Proposed Actions:

- Provide examples of local tree inventories and EAB response plans as well as contacts for additional assistance.
- Consolidate and map municipal tree inventory data to determine where concentrations of ash and other woody biomass are located within Dane County.
- Evaluate potential Wood Utilization Yard sites in a way that takes adjacent property owners and potential impacts on transportation corridors into consideration.
- Contact community representatives to determine how municipal wood residue is currently managed; investigate and encourage existing partnerships with Dane County businesses.
- Continuously explore options for funding EAB control actions and communicate new opportunities to the public as they arise.
- Identify and promote cost-effective means for Dane County and its communities to remove, dispose of, and utilize EAB affected wood.

Goal #3:**Find ways to put wood formerly considered “waste” to positive and profitable use.****Priorities:**

- Develop partnerships with a wide variety of wood users in southern Wisconsin.
- Consider the purchase of equipment that may be needed to process Dane County’s wood residue.
- Investigate the requirements for wood utilization operations, including equipment, maintenance, staffing and management, and leased or contracted services.

Proposed Actions:

- Explore a wide variety of options for wood utilization at both small and large scales.
- Investigate the potential for partnerships with biofuel manufacturers and users.

Historical Background

The emerald ash borer (*Agrilus planipennis*) is native to China, Japan, and other parts of east Asia (Figure 3). Most likely, the insect traveled from Asia to southeastern Michigan unintentionally concealed within solid wood packing materials (crates) routinely used for international cargo shipments. By the time the presence of EAB was confirmed in the Detroit area in the summer of 2002, infestations were already well established. Experts believe that the beetle was present for up to twelve years prior to its identification.

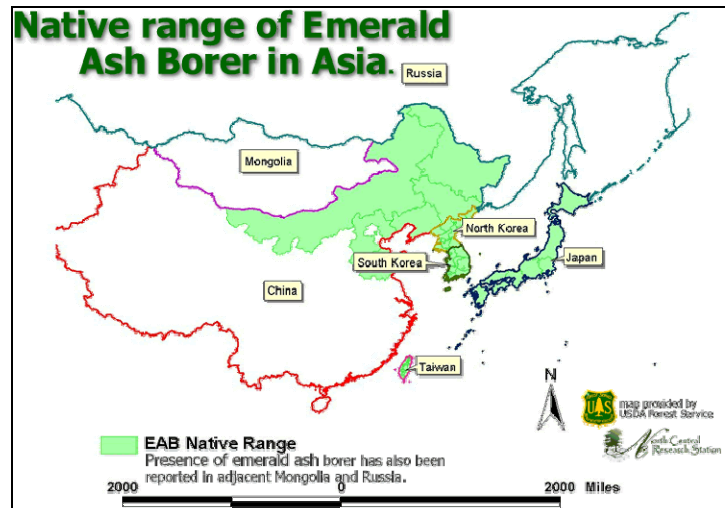


Figure 3: The EAB's Native Range (Map: USDA Forest Service)

In the EAB's natural habitat, populations are kept in check by predators and pathogens and by the fact that Asian ash trees have developed coevolutionary resistance to EAB attacks. In North America, on the other hand, the EAB has few predators and ash trees have no natural resistance. While North American woodpeckers and other insectivores have been observed eating EAB larvae, this predation has not had a significant impact on EAB populations. Left to its own devices, the emerald ash borer can expand its range up to several miles per year during the adult beetles' June to August flight period. **Human activities, however, have led to the spread of the EAB over much greater distances.** Shipments of nursery stock and firewood have been inadvertently responsible for the majority of new EAB introductions.

The effects of the EAB in North America have been devastating. In the Detroit area alone, over 15 million ash trees have succumbed to EAB infestation. EAB is now found throughout Michigan, Ohio, and southern Ontario. This invasive insect is also becoming established in Indiana, Illinois, Maryland, Missouri, Pennsylvania, Virginia, West Virginia, and Wisconsin. The costs to impacted communities have been considerable. In residential areas, tree removal and replacement is often necessary. Businesses such as nurseries, mills, and firewood producers have been impacted by quarantine restrictions put in place to slow the spread of EAB.

EAB Planning Efforts in Wisconsin

The emerald ash borer attacks ash trees. All of Wisconsin's native ash species (genus *Fraxinus*) are susceptible to EAB infestation. This includes green, white, black, and blue ash, as well as less common horticultural cultivars. Studies have indicated a preference for green ash over other varieties and have shown that adult EAB beetles tend to target trees in sunny, open locations. EAB larvae feed on vascular tissue located directly beneath a tree's bark. As they feed, they create distinctive S-shaped tunnels (see Figure 18) and critically disrupt the tree's ability to circulate water and nutrients. It appears that EAB infestation is always fatal, with infested trees dying in one to three years.

In an effort to detect the presence of the emerald ash borer before it becomes widespread in Wisconsin, the DNR has conducted visual and detection-tree surveys throughout the state, enacted firewood restrictions on state properties, and worked to educate the public about the threat of EAB and the signs and symptoms of EAB activity.

2004 Survey Summary

The DNR first surveyed for EAB during the summer of 2004 (June–September). The goals of the 2004 survey were (1) to collect baseline data on the current health status of Wisconsin's ash resource and (2) to detect any emerald ash borer infestations in Wisconsin. Visual and detection-tree surveys were conducted in 51 state parks and forests, with emphasis on ash trees in campgrounds and firewood storage and sale areas. These efforts focused on state parks and forests because the EAB was deemed most likely to enter Wisconsin via larvae-infested wood (including firewood, unprocessed logs, and nursery stock). The 2004 survey did not indicate the presence of the EAB in Wisconsin.

2005 Survey Summary

In 2005, the target survey area was expanded to include private and county campgrounds. This survey focused on the northeastern and southeastern parts of the state, where the risk of EAB introduction is highest. Due to the large number of ash trees encountered, a maximum of two trees per campsite were surveyed in order to allow a greater overall number of campgrounds to be surveyed. Additional survey efforts targeted firewood transported into the state from Michigan by ferry and urban ash trees in Kenosha, Milwaukee, and Racine Counties. Again, no emerald ash borer activity was detected.

2006 Survey Summary and Initial Control Efforts

Because transported firewood is one of the most common pathways of local EAB introduction, the DNR and DATCP took action in 2006 to discourage firewood users from moving potentially infested wood. In the spring of 2006, a temporary rule restricting the movement of firewood went into place (NR45.04(1)(g)). In addition, the process of establishing a permanent rule creating a 50-mile restriction on firewood brought onto public lands was initiated. Complementing these regulatory actions, the state launched an extensive public education and outreach project which included public presentations, media interviews, and direct mailings targeting campground users.

At the same time, the DNR continued its survey and monitoring efforts. The 2006 survey included a visual assessment of more than 3,500 trees on 235 private and county campgrounds and recreational areas throughout central, south-central, and southwestern

Wisconsin as well as the establishment of 131 detection trees on state park lands. (*Note:* Establishment of a detection tree entails girdling the main stem at waist height and placing an 18-inch-wide sticky band just above the girdle. The sticky band is used to catch emerald ash borer adults during their flight season; see Figure 4). As in previous years, surveys did not detect EAB in Wisconsin.

2007 Survey Summary

Visual surveys in 2007 concentrated on 80 private and county campgrounds, since state campgrounds were now carefully monitoring incoming firewood. Over 5,600 campsites were surveyed, resulting in the evaluation of 2,650 ash trees for the presence of the emerald ash borer. In addition, 141 detection trees were established in 26 state park and recreation areas during May 2007. Purple panel traps (Figure 5) were used for the first time in 2007. These traps were hung in 17 central and southern Wisconsin locations. None of the 2007 surveys indicated the presence of the EAB.

2008 Survey Summary

Proactive statewide surveys continued in 2008. 3,600 purple panel traps were placed in ash trees across Wisconsin in the spring and more than 700 detection trees in 29 counties are scheduled to be felled for examination in the fall of 2008. In August of 2008, forest health specialists investigating a citizen report of dying ash trees discovered emerald ash borer larvae and adults at a private home in Ozaukee County near the Village of Newburg. Soon after, three EAB adults were found on a purple panel trap in Newburg's Fireman's Park, along with a second infestation. In response, a four county quarantine was established covering Ozaukee, Washington, Fond du Lac, and Sheboygan Counties. Infestation specific delimitation surveys are ongoing in the quarantined areas. In October of 2008, a newly planted tree in Kenosha County was found to be EAB infested.



Figure 4: EAB Detection Tree (Photo: EAB Toolkit for Wisconsin Communities)



Figure 5: EAB Purple Panel Trap (Photo: EAB Toolkit for Wisconsin Communities)

Dane County's 2008 detection tree survey was completed in September and yielded no EAB larvae. Figure 6 summarizes EAB Detection efforts within Dane County between 2004 and 2008. Updates on confirmed infestations and surveys can be found at <http://www.emeraldashborer.wi.gov/>.

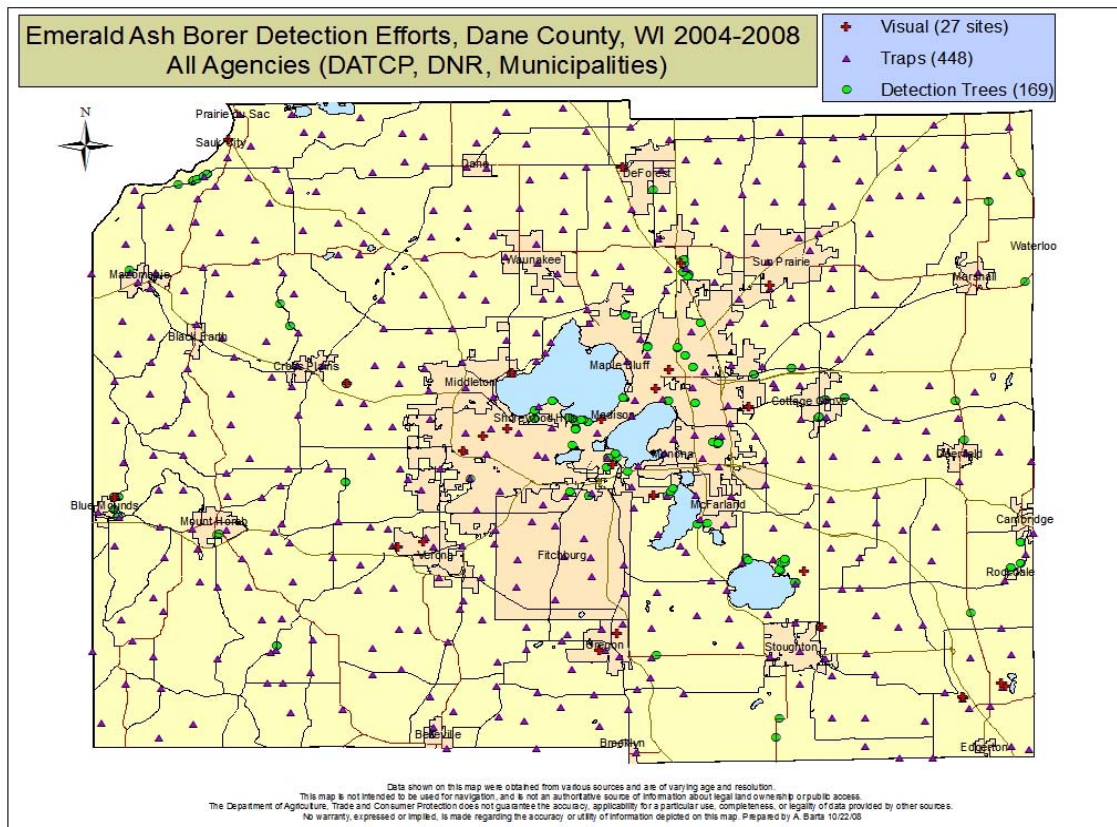


Figure 6: EAB Detection Efforts in Dane County, 2004-2008

The Wisconsin Emerald Ash Borer Response Plan

With the goal of providing immediate guidance to state agencies in the event of a confirmed EAB infestation, Wisconsin's *Emerald Ash Borer Response Plan* was created in 2006 and most recently updated in May of 2008. The plan was developed by DATCP and DNR, with significant input from partners including the University of Wisconsin, the United States Department of Agriculture, and the United States Forest Service. The plan takes new scientific information and recommendations into account and is designed to be an updatable document. This plan is available at <http://dnr.wi.gov/forestry/fh/pdf/WIEABResponsePlan.pdf>.

The Emerald Ash Borer Toolkit for Wisconsin Communities

As a part of the 2006 public education and outreach campaign, DNR, DATCP, and UW-Extension developed a comprehensive EAB resource for local governments. The *Emerald Ash Borer Toolkit for Wisconsin Communities* contains background information on the EAB and its effects, suggestions for developing and implementing a municipal EAB response plan, and much more. The Toolkit was developed with the goals of (1) keeping the EAB out of Wisconsin for as long as possible and (2) supporting proactive planning for its eventual arrival. The Toolkit is available in three formats: an online webpage, a CD, or a 3-ring binder hard copy. To access or order the Toolkit, see <http://dnr.wi.gov/forestry/uf/eab/>.

EAB Management Precedents

Although an exhaustive review of EAB management precedents is outside the scope of this plan, it is important to keep in mind that we are not reinventing the wheel. In addition to looking to Wisconsin's EAB management and planning efforts for guidance, Dane County and its residents can learn valuable lessons from the dozens of communities that already have several years of experience dealing with this issue. This section contains a summary of EAB management efforts; recommendations based on current scientific and management standards can be found in the Plan Recommendations section, below. EAB management strategies fall into three general categories: prevention, detection, and control/containment.

Prevention

Prevention requires a combination of education and regulation. Public education about what the EAB is and the risks that it poses, coupled with regulations restricting the movement of firewood and nursery stock, are the main tools managers have deployed in their attempts to halt the EAB's spread. Managers agree that proactive planning is key to successfully handling the arrival of the EAB. For this reason, any strategy that can slow the EAB's spread is of great benefit; delaying the beetle's local arrival buys communities time to prepare. Many municipalities in states where the EAB is well-established have developed their own EAB management plans. Often these plans are concise documents outlining local protocols for dealing with dead or dying ash trees. The following municipalities are among those with EAB management plans that can be accessed through a simple online search:

City of Chicago, Illinois
Village of Lincolnwood, Illinois
Village of Wilmette, Illinois
Village of Granville, Ohio
City of Sandusky, Ohio

City of Shaker Heights, Ohio
City of Strongsville, Ohio
City of Upper Arlington, Ohio
City of Wyoming, Ohio

In Wisconsin, many communities are in the process of developing EAB preparedness and response plans. In Dane County alone, the Village of Deerfield, Village of Deforest, City of Madison, Village of Shorewood Hills, and City of Stoughton have initiated this process. In addition, some non-municipal groups, such as Troy Gardens, have conducted excellent inventories of the trees on their properties. This county-level plan strives to integrate and complement municipal plans in order to provide greater options for wood utilization than would be possible at the local level alone.

In addition, strategies for EAB management are constantly being updated as new scientific research is conducted and as managers gain more experience dealing with this invasive beetle. If the spread of the EAB can be slowed, many communities may be able to benefit from new and better control options available in the future.

Detection

Professional natural resource managers have developed surveys, many of them described in the previous section, that may detect the EAB's presence before infestation becomes widespread. Public education about the signs, symptoms, and identification of the EAB may also play an important role in EAB detection. The earliest infestations in the Detroit area went undetected for up to twelve years. In this case, people did not know what was making their ash trees sick or what to look for. In subsequent infestations, many communities estimate that the EAB was present in their community for at least three years before it was detected. At this point, the infestation is no longer limited to a specific, immediate area. If a new EAB infestation can be detected while it is still limited in scale, it may be controllable through ash reduction or the application of insecticidal agents. Communities that have experienced the turmoil caused by the EAB's arrival firsthand have also noted that early detection ultimately saves money on removals, since removing live trees is much less costly than removing dead ones.

Control/Containment

Once the EAB is confirmed in a given area, management shifts from a proactive to a reactive approach. There are several control/containment methods that have proven successful in various cases. Managers have found that the number of insects present, the geographic extent of the infestation, and how long the EAB has been present are significant factors in determining whether or not taking aggressive action to eliminate the EAB from the area is practical. The density of ash trees in the vicinity of the infestation is also an important consideration (the more ash trees in close proximity to the infestation, the higher the risk that the infestation will spread).

Plan Recommendations

The Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan is based on current science and up-to-date management recommendations. Because the EAB is still a relatively recent phenomenon in North America, studies regarding its control and management are ongoing. This plan draws on presently available information and is designed to take new research into account. The Dane County Tree Board and the University of Wisconsin-Extension will assist the County in the ongoing planning process. With this in mind, the following recommendations have been designed to help Dane County municipalities, local officials, and residents prepare for the arrival of the EAB.

First Steps: Immediate Management Actions

There are a few essential proactive steps everyone should take right now to get ready for the EAB's arrival:

- ❑ Learn as much as you can about the EAB and begin working to educate others in your community (see Education and Outreach Efforts, below).
- ❑ Know the signs and symptoms of an EAB infestation. Monitor continuously for EAB in your community (see Monitoring Efforts, below).
- ❑ Know who to contact. If you suspect EAB, contact your municipal forester or public works director. This person should then notify Dane County and the Wisconsin DNR's regional coordinator. You may also call the State of Wisconsin's EAB hotline at 1-800-462-2803.

EAB Planning for Municipalities

There are several critical additional steps municipalities need to take to prepare for the arrival of EAB.

- ❑ Conduct a municipal tree inventory. Pay attention to the quantity, quality, and location of publically-owned ash trees as well as other tree species. With a tree inventory in place, you will have a good sense of how much your community has invested in its trees and—if and when the EAB does arrive—will have a realistic estimate of the costs of ash removal and replacement. The DNR and DATCP estimate that it costs approximately \$340 to remove an average sized (12" DBH) street ash tree. The cost of replacing a removed tree averages around \$375. These costs tend to increase on private property due to accessibility issues. In the long-run, a tree inventory will position your community to make decisions that promote community forest health and protect your investment. Tree inventories can range from detailed GIS surveys to simple assessments of tree species, locations, and health. The following website has information on how to get started: http://www.co.st-lawrence.ny.us/Cooperative_Extension/forestry/03treeinventory.html.

- Stop planting and consider removing ash trees. If a municipally-owned ash tree is not in prime condition or location, you may wish to remove this tree now in order to reduce strains on workload and budget once EAB arrives. Some communities have opted to remove a majority of their ash trees preemptively in order to distribute the associated costs over multiple budget years. Whatever you decide regarding ash removal, work toward a diverse urban forest in your community (see this plan’s Post EAB Reforestation Efforts section).

- Develop a proactive municipal EAB response plan. Drawing on the information in this plan and in the *Emerald Ash Borer Toolkit for Wisconsin Communities*, most municipalities will be able to create a concise, simple plan that is tailored to their local programs and needs. In addition to the example plans cited above, the *Toolkit* provides suggestions for planning and lists the following components of a thorough local EAB readiness plan:
 - **purpose** – how the plan will be used and its intended results
 - **scope** – geographic area and properties covered by the plan
 - **definitions** – technical or unfamiliar terms
 - **roles & responsibilities** – specific persons and contact information for various tasks, including federal and state contacts
 - **detection methods** – a prioritized inspection and monitoring strategy; may include use of trap trees to aid in detection
 - **inventory based cost projections** – dollar value of the local ash resource, estimated removal and replacement costs, cost impact on community storm water management and energy use
 - **funding** – sources of local funds if state assistance is not available; commitments from corporate or private partners, utility companies, etc.
 - **tree removal** – technical and safety specifications, bonding and insurance requirements and other standards established; contracts or agreements with local arborists/tree services
 - **marshalling yards & wood disposal/utilization** – appropriate site(s) identified; wood disposal or utilization strategy in place & in compliance with DATCP requirements; list of potential wood users/buyers; procedure for obtaining permits for debris burning or composting, if allowed
 - **communication and awareness** – strategy for informing local leaders, staff, media and residents; guidance for choosing qualified arborists, suitable replacement trees, etc.
 - **approval** – readiness plan approval by the community’s political body

- Know the EAB related regulations in your area. Since the EAB has not yet been detected in Dane County, quarantines have not been put in place. If the EAB is detected, this will change quickly. The following regulations are now in place:

- The State of Wisconsin restricts firewood originating from greater than 50 miles away from state property, including campgrounds and parks (NR 45.04(1)(g); see Appendix C).
- Dane County has an ordinance prohibiting firewood originating from more than 50 miles away or out-of-state within Dane County parks or campgrounds (Dane County Ordinance Amendment 32). Several other counties in Wisconsin—including Barron, Dodge, Clark, Jackson, Marathon, Marinette, Portage, Sauk, and St. Croix Counties—have similar ordinances restricting firewood in county parks, campgrounds and/or forests.
See: http://www.datcp.state.wi.us/arm/environment/insects/firewood_restrictions/index.jsp.
- **Note:** Dane County does not have the legal authority to enact a countywide ordinance prohibiting firewood from entering the County.

Up-to-date information on regulations in Wisconsin can be found at: <http://dnr.wi.gov/forestry/fh/ash/> or <http://www.datcp.state.wi.us/arm/environment/insects/emerald-ash-borer/index.jsp>.

The *Emerald Ash Borer Toolkit for Wisconsin Communities* also contains an “EAB Readiness Checklist” that municipal officials may find valuable. See: [http://dnr.wi.gov/forestry/uf/eab/EABToolkitCD/01. Introduction & How to Use the Toolkit/f. EAB Readiness Checklist/EAB Readiness Checklist.doc](http://dnr.wi.gov/forestry/uf/eab/EABToolkitCD/01.Introduction%20&%20How%20to%20Use%20the%20Toolkit/f.EAB%20Readiness%20Checklist/EAB%20Readiness%20Checklist.doc)

EAB Planning for Homeowners

Individual homeowners will also need to determine how they will respond to the threat of EAB on their property. A certified arborist can help with any step or option you choose (a directory of certified arborists serving Dane County can be found in Appendix E). The steps private residents should take to prepare for EAB are similar to EAB management actions at the municipal level:

- Conduct an inventory of your trees:
 - How many trees do you have?
 - What kinds of trees do you have? Use a tree key (see <http://www.uwsp.edu/cnr/leaf/Treekey/tkframe.htm> for a simple online version) to identify the species present on your property.
 - Do you have ash on your property? If the answer is yes, proceed to the following steps.
- Determine the health and value of your ash trees. A certified arborist can assist with this. It may make sense to remove ash trees that are sick or poorly placed sooner rather than later.

- Be prepared with your own EAB Response Plan. Whatever you decide, keep in mind that the cost of removing a dead tree is significantly higher than for a live tree because dead, dry wood shatters and requires a more intensive clean-up. In addition, arborists may be able to find value-added uses for live trees and pass their cost savings on to you. Consider the following EAB management options:
 - Will you treat any of your ash trees with insecticides? Various options are outlined below in this plan’s “Control Methods” section.
 - Will you remove and replace your ash trees prior to the arrival of EAB?
 - Will you wait until your ash begin showing signs of infestation to remove them?
 - Will you plant replacement trees now, but wait until trees become infested to remove them?

Dane County is currently exploring options for incentive programs and partnerships that may be able to help offset the costs associated with removing and replacing ash trees on private property. Vouchers that can be used for arborists’ services or to purchase replacement trees may be integrated into this program.

Education and Outreach Efforts

Because public awareness is vital to slowing the spread of the EAB and to early detection, Dane County recommends that municipal officials take steps to educate themselves and their constituents about the emerald ash borer. Communities are urged to organize one or more local EAB informational events. Such events can take several forms:

- *Meetings*: In many cases, DATCP and/or DNR personnel can attend a local meeting, give a presentation, and answer your questions about the EAB. While it may be possible to organize a special meeting for this purpose, many municipalities already have regularly scheduled meeting times. You could devote part or all of one of these meetings to EAB education. Make sure all interested residents are included.
- *Family Events*: Organize a family friendly event that includes an EAB education component. This could be held in conjunction with Arbor Day (celebrated in the last week of April) or another community event.
- *Displays, Brochures, and Cards*: Set up an EAB display in a municipal office, library, or other controlled indoor environment. DATCP has displays that can be loaned to communities as well as brochures and EAB identification cards that can be distributed to interested residents.
- *Doorhangers*: A template that can tailored to fit your community’s specific needs and printed on colored cardstock can be found in Appendix H.
- *Articles*: Include an article about the EAB in a municipal newsletter. DATCP has pre-written articles that can be used for this purpose.

It may be possible to organize a local “EAB Awareness Week” that includes a combination of these strategies. As a local leader, you have the knowledge needed to determine what type of outreach is right for your community. For help getting started, contact Mick Skwarok, DATCP Plant Pest Assessment and Outreach Specialist (michael.skwarok@wisconsin.gov). In some instances, it may make sense to coordinate your EAB outreach efforts with those of surrounding municipalities.

Monitoring Efforts

Ash Tree Identification

Since the EAB attacks only ash trees, monitoring for its presence means knowing how to identify ash. There are several varieties of ash in Wisconsin. Green ash (*Fraxinus pennsylvanica*) and white ash (*Fraxinus americana*) are widespread in our region. Black ash (*Fraxinus nigra*) and blue ash (*Fraxinus quadrangulata*) are less common. Horticultural cultivars of these species are also susceptible to EAB attack.

All varieties of ash trees have opposite branching and bud arrangement (Figure 7) and compound leaves composed of between 5 and 11 leaflets (Figure 8). On mature ash trees, bark forms a distinctive pattern of diamond shaped ridges (Figure 9). Ash seeds hang in clusters of oar-shaped samaras (Figure 10).



Figure 7: Opposite Branching and Budding (Photo: Paul Wray, Iowa State University)



Figure 8: Compound Leaflet

(Photo: Pennsylvania Department of Conservation and Natural Resources)



Figure 9: Ash Bark-Diamond-shaped Ridges (Photo: Keith Kanoti, Maine Forest Service)



Figure 10: Ash-Seed-Oar-shaped Samaras (Photo: Keith Kanoti, Maine Forest Service)

Mountain ash is not a true ash and is not at risk for EAB infestation. For more information on tree identification and ash “lookalikes,” see <http://www.emeraldashborer.info/files/E2892Ash1.pdf>.

Signs and Symptoms of EAB

Because newly infested trees often show no visible symptoms, detection of EAB can be challenging. Foresters have also noticed that in the first two years of an infestation, the EAB is found mainly in the crowns of trees, making it easy to overlook the insects' presence. When conducting early detection surveys, therefore, it is critical to look at the upper canopies of ash trees in as many locations as possible. In addition, managers in Illinois have recently suggested that monitoring and delimitation surveys should focus on branches with a 6 inch or larger diameter because smaller branches produce inconsistent results in cases of low to moderate infestation. Survey work in Illinois also suggests that EAB larvae tend to be found where bark has become rough or furrowed within the last two years.

Some of the signs and symptoms of EAB infestation are the same as those exhibited by any tree in decline. As a preemptive measure, the County arborist is currently documenting County-owned ash trees with these general symptoms, as well as ash trees that have died within the last one to two years. Ash trees showing symptoms of decline are being mapped and documented for follow-up visits. Symptoms of decline include:

- Epicormic sprouting (branches produced from the tree's base) (Figure 11).
- Dead or dying branches in the upper crown (Figure 12).
- Yellow or off-color foliage during the growing season (Figure 12).

Knowing and monitoring the general symptoms of ash decline may lead to the discovery of more specific signs and symptoms indicating the presence of the emerald ash borer. If you have an ash tree in decline and are suspicious that it may have EAB, contact your municipal forester or public works director.



Figure 11: Epicormic Sprouting (Photo: Minnesota Department of Natural Resources Archive)



Figure 12: Branch Dieback and Discoloration
(Photo: University of Wisconsin Department of Entomology)

In addition to these general symptoms of ill-health, there are several more specific indicators of EAB activity:

- *D-shaped Exit Holes*: When EAB adults emerge from beneath the bark, they create distinctive D-shaped exit holes. These holes can be easily observed on young trees with smooth bark but can be more difficult to locate on older trees with rough bark. EAB exit holes are small: only 1/8 inch in diameter. Exit holes may occur on the trunk as well as on any branch larger than 1 to 2 inches in diameter (Figure 13). The exit holes of ash borers other than the EAB are typically larger and/or have a more rounded shape.
- *Vertical Bark-splits*. The feeding of EAB larvae often causes a characteristic 2 to 5 inch split in a tree's bark. In some cases, S-shaped larval galleries can be seen beneath these splits (Figure 14).
- *Increased Woodpecker Activity*: Woodpeckers feed on EAB larvae. Woodpecker activity that has removed patches of bark may be a sign of EAB infestation (Figure 15).
- *Presence of Metallic Green Beetles*: Adult EAB beetles are metallic green in color and are 3/8 - 1/2 inch in length and 1/16 inch in width. The EAB is often described as "bullet-shaped" and is small enough to fit on a penny. If you find a small beetle that fits this description, collect and preserve it in alcohol for identification (Figures 16 and 17).

Where further investigation is required, an arborist may remove a portion of the bark and look for evidence of:

- *Winding S-shaped Galleries*: As EAB larvae feed, they tend to wind tightly back and forth, creating distinctive S-shaped galleries that can be found both on the inner bark surface and the outer wood surface (Figure 18).
- *Cream-colored Larvae*: EAB larvae are cream-colored and have distinct bell-shaped body segments and pincher-like appendages at the end of their abdomen. Mature larvae reach 1 1/2 inches in length and are always found feeding beneath the bark. If you find possible EAB larvae, collect and preserve them in alcohol for identification (Figure 19).



Figure 13: D-shaped Exit Holes
(Photo: Renee Pinski, WDNR)



Figure 14: Vertical Bark Splits
(Photo: Linda Williams, WDNR)



Figure 15: Woodpecker Activity (Photo: David Cappaert, Michigan State University)



Figure 16: Adult EAB
(Photo: Pest and Disease Image Laboratory)



Figure 17: Adult EAB
(Photo: Renee Pinski, WDNR)



Figure 18: S-shaped Galleries
(Photo: Wisconsin DNR)



Figure 19: EAB Larvae
(Photo: Linda Williams, WDNR)

All insect samples should be forwarded to the DATCP identifier (Krista Hamilton, 608-224-4594) or the UW identifier (Phil Pellitteri, 608-262-6510) for screening and preliminary identification.

EAB Confirmation, Notification, and Mobilization

Dane County recommends immediately notifying the Land and Water Resources Department (LWRD) Director of any suspected EAB find. LWRD will then notify the County Executive's Office and the Department of Public Works, as outlined in Figure 20. The first Wisconsin EAB find was confirmed by the United States Department of Agriculture-Animal and Plant Health Inspection Service (APHIS) laboratory in Brighton, Michigan. The first Dane County specimen will be formally confirmed by the APHIS lab or by specialists at DATCP. Affected individuals including local lawmakers and elected officials, property owners, and other key stakeholders will be notified prior to the public release of information on new EAB finds. APHIS is also asked to specifically notify the Dane County Land and Water Resources Department (LWRD) of confirmed EAB finds within the County prior to any public announcement. Municipal forest management contacts in Dane County are included in Appendix J.

In the event that the EAB is confirmed in Dane County, the Incident Command System (ICS) Response Organization will be activated, as outlined in Wisconsin's *Emerald Ash Borer Response Plan*. The ICS Response structure enables various agencies to work cooperatively to establish a common set of incident management objectives and strategies. The ICS Response Organization will coordinate the gathering of data and implement the response plan at the state level. In order to ensure that Dane County's understanding of state-level EAB management and regulatory measures is up-to-date, representatives of Dane County may request inclusion in ICS meetings. Where appropriate, this information can then be accurately communicated to the County's residents, local officials, and municipalities. According to the 2008 version of the *Wisconsin Emerald Ash Borer Response Plan*, ICS Operations (led by DATCP with assistance and input from DNR) will take the following immediate actions (see Figure 20).

1. Regulate Pathways to Prevent Spread

In order to prevent the infestation's artificial (human assisted) spread, DATCP has the authority to quarantine items that may inadvertently transport the EAB. Quarantined materials will include:

- Ash trees, limbs, branches, and roots
- Ash logs, slabs, or untreated ash lumber with bark attached
- Cut firewood of all non-coniferous species
- Ash chips and ash bark fragments larger than one inch in two diameters
- Mixed wood residue that may contain ash
- Any other item which could harbor living EAB eggs, larvae, or adults and thus transmit an infestation.

Quarantines are possible at both federal and state levels. A federal quarantine will regulate *interstate* (between states) movement of materials. A state quarantine will regulate *intrastate* (within the state) movement. While both levels of quarantine could be imposed concurrently, quarantines in Wisconsin will almost certainly be established by

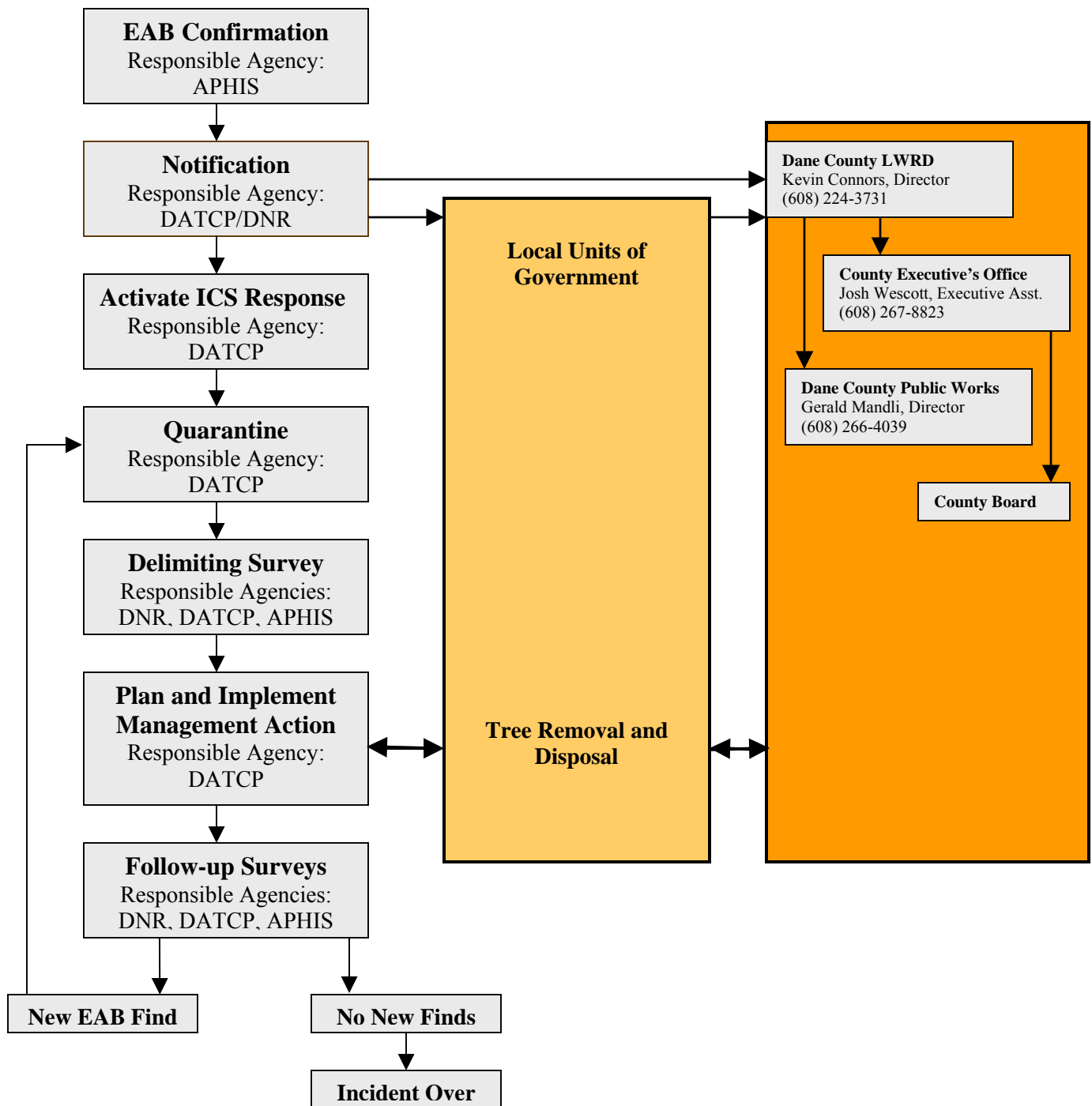


Figure 20: Actions Following EAB Confirmation

county. Since materials often need to be transported for processing, DATCP currently views the county as the minimum quarantine level. State and federal agency staff are responsible for the enforcement of quarantines. Keep in mind that movement of infested and potentially-infested materials *within* the County may not be a legal issue, but it *is* an ethical one; actions should be taken to process these materials as locally as possible.

Federal regulations pertaining to the EAB can be found in the Code of Federal Regulations (7CFR301.53-1 through 9). State regulations can be found in the Wisconsin Administrative Code (ATCP 21.17). See Appendix C of this plan for additional information on federal and state regulations and links. In addition, Dane County currently has an ordinance (Ordinance Amendment 32, amending Chapter 53 of the Dane County Code of Ordinances, Effective November 1, 2007) prohibiting firewood that originates from more than fifty miles away or out of state from its parks and campgrounds. Although Dane County plans to do everything in its power to prevent the spread of the EAB within the County, it does not have the legal authority to restrict firewood movement at a countywide level, nor to put sub-county quarantines in place.

Quarantines will primarily affect nurseries, firewood dealers, and mills. USDA and DATCP staff will work with industries and communities to minimize the impact of quarantines. Compliance agreements are common tools that allow companies to conduct business while protecting areas of the state not yet infested by the EAB. In most cases, this means transporting quarantined material into unquarantined areas only from October 1 to May 1 (when the EAB is in its larval form under the bark of trees) and ensuring that all material is processed to legal specifications prior to May 1 (when the EAB begins its adult “flight” period). In some cases, material may be removed from a quarantined area if it is inspected and certified free of EAB.

2. Conduct a Delimiting Survey

An intensive survey to determine the extent of the infested area will be the first response to any EAB detection. This delimiting survey may incorporate a variety of survey techniques including the inspection of tree canopies (facilitated by tree climbers or bucket trucks), the felling and peeling of suspect trees, and/or a combination of these methods. A delimiting survey enables managers to estimate the magnitude of an infestation (how many insects are present, how many trees are infested, and the geographic scope) in order to prescribe a best course of action. In some cases, the origin/s of a local infestation can also be traced through delimiting survey data.

3. Develop a Results-based Action Plan

Once the delimiting survey is complete, a plan of action will be developed using the ICS system with the goals of limiting the initial infestation’s spread and ensuring the most appropriate management strategy for the specific site. Mobilization of additional resources will take place according to this plan. Various management options are discussed in the following section. As well, efforts to determine the original source of the EAB infestation will continue in order to determine whether or not additional actions need to be taken to locate other undiscovered infestations or prevent further introductions.

Funding for EAB Management

The costs associated with EAB will be born primarily at the local level. With proactive planning, however, these costs can be reduced and distributed over multiple budget years. While federal and state funds are unlikely to become available for EAB management, funding assistance for municipalities may be available through several other sources. Wisconsin is currently urging municipalities and residents to independently explore various potential funding options:

- *Fund Reallocation*: Shifting funds from one part of a municipal budget to the department/s responsible for municipally-owned trees will be the most common and most substantial way of funding EAB response. Increasing the amount of funding allocated to urban forestry *now*—before EAB arrives—will not only allow communities to prepare for EAB, but will enable the long-term development of diverse urban forests and ensure that communities are prepared to handle future storm and infestation events. When considering fund reallocation, the challenges of EAB can be viewed as an opportunity for growth.
- *Wisconsin Urban Forestry Grants (DNR)*: While these grants are not able to provide funding for control efforts at current funding levels, they may be able to help communities with urban forest management and EAB readiness (which is likely to include tree inventories and local EAB response plans). These grants may also assist with reforestation efforts.
See: <http://dnr.wi.gov/forestry/UF/grants/>.
- *Community Development Block Grants*: This type of funding has been used by some EAB affected communities in other states to pay for EAB control measures.
- *Transportation Funds*: Funds designated for roads may be accessed to pay for EAB control efforts along rights-of-way. Transportation Enhancement funds may also be available to assist with replanting.
See: <http://www.dot.wisconsin.gov/localgov/aid/te.htm>.
- *Utility Companies*: In some cases, utility companies may be able to assist with trees located under power lines. Line clearance contacts for major electric utility companies in Dane County include:
 - Alliant Energy Customer Service, 1-800-862-6222
customercare@alliantenergy.com
 - American Transmission Company, contact Chris Dailey at (262) 506-6884
cdailey@atcllc.com
 - Madison Gas & Electric, contact Scott Nelson at (608) 252-7186
snelson@mge.com

Several municipalities have their own local electric utility companies:

- Black Earth Electric Utility, (608) 767-2563

- Stoughton Utilities, (608) 873-3379
- Sun Prairie Water and Light, (608) 837-5500
- *Taxes:* While likely to be an unpopular solution, some communities have chosen to raise taxes in order to fund EAB management.
- *Community Foundations:* Some communities have charitable foundations that may be able to assist with funding for EAB response. TreeBank is a program that helps communities set up local branches and receive donations in order to fund community tree planting, education, and stewardship.
See: <http://www.itreebank.org/>.

More details on these and other potential funding sources can be found in the *EAB Toolkit for Wisconsin Communities* at:
<http://dnr.wi.gov/forestry/uf/eab/EABToolkitCD/10.%20Funding/b.%20How%20to%20Pay%20for%20EAB/How%20to%20Pay%20for%20EAB.doc>.

EAB Management in Dane County Public-Use Areas

Dane County has established the following plan of action to prepare for and respond to EAB within its own public-use areas:

Proactive (Pre-EAB) Response Actions

- Public-use areas in which ash composes over 10% of all trees will be targeted for active management aimed at species diversification.
Note: 16 of the 27 Dane County parks have greater than 10% ash.
- Within these active management areas, ash trees will be removed and replaced at a rate of 2-3 per year.
- Priority for removal will be determined based on the health of the tree (those showing signs of stress will be removed and replaced first) and size (smaller trees will be removed before larger ones in order to lessen the immediate impact on parks and park users).
- Removals will begin in 2010 and will take place over a ten year period of time.
- Another component of active management is insecticide treatment. Dane County will recommend using insecticides to treat select high value/high use ash that are in good condition and prime location.

EAB Control

- Once EAB arrives in Dane County, infested trees will be removed as they are identified.

Wood Utilization

- Currently, logs larger than 15” are sold for use as firewood in an open bidding process. Other wood residue is run through portable chippers and used by the County and private residents for mulch.

- Wood residue will be processed as locally as possible in order to reduce the likelihood of spread to other areas of Dane County.
- Modifications to current wood utilization process will be made as the County continues to explore and develop additional value-added markets.

Control Methods

The following section summarizes current recommendations for EAB control and containment. It is important to keep in mind that research on EAB control is ongoing; the consensus regarding what “best practice” means is constantly being updated. As well, there is no such thing as a universal, “one-size-fits-all” EAB control strategy. The State anticipates documents from the Incident Command System team regarding the Newburg infestation in the spring of 2009. As well, a State EAB Advisory Group is currently developing formal EAB control recommendations for municipalities and woodlot owners. These documents, as well as ongoing updates regarding recommended EAB control methods will be viewable at <http://emeraldashborer.wi.gov/>.

Think carefully about your community’s unique needs when weighing the various options. EAB control and containment options are outlined in the *Wisconsin Emerald Ash Borer Response Plan*. The State Plan also enumerates factors that are likely to influence the decision-making process. Based on these factors, Dane County encourages local officials, municipalities, and residents to consider the following questions when developing an EAB control strategy:

- What are the environmental impacts of the control option under consideration? How would the environmental impacts be different if no action were taken or if a different EAB control option were implemented instead?
- Who owns the affected land? How does land ownership influence access to the site?
- What is the predominant land use in the affected area? Is the site a designated natural area? What type of ecosystem/s surround the site? Is the EAB control option under consideration consistent with the land use goals for affected area?
- How much does the control option cost?
- Do sufficient financial and human resources exist to make the control option viable? Is the necessary equipment available or obtainable?
- What are the potential social, cultural, and/or psychological impacts of the control method?
- How large is the EAB infestation? How long has it been there?
- Do indigenous peoples living in the area (in Dane County, this is likely to mean citizens of the Ho-Chunk Nation who use black ash in traditional basketry) have additional concerns that need to be taken into account?

Dane County will consider all of these questions carefully when evaluating EAB control and containment options to be implemented on County lands.

The following three options are recommended for the control and containment of the EAB at the local level:

Insecticides

University of Wisconsin-Extension recommends the use of systemic insecticides to control the EAB in certain cases. Treatments are suggested *only* for ash trees located within ten to twelve miles of a confirmed EAB infestation site or within a quarantined area. Outside of these areas, treatment is *not* necessary. Research has shown that when used to treat trees that are already infested, insecticides are much more effective on trees with less than 40% canopy dieback. Trees that have greater than 40% canopy dieback do not respond well to treatment and should be removed. There are currently three available options for insecticide treatment:

- **Imidacloprid soil drenches** are applied around the ash tree's base once a year in mid-April to mid-May. This type of treatment has proven most effective on smaller ash trees (under six inches DBH (diameter at breast height)). Imidacloprid soil drenches are available in the form of *Bayer Advanced Garden Tree and Shrub Insect Control* and *Ferti-lome Systemic Tree and Shrub Drench*. Bayer and Ferti-lome products are available at most hardware and garden stores or directly from the manufacturers (www.bayeradvanced.com, www.fertilome.com).
- **Acephate trunk implants** are inserted directly into the tree's trunk in mid-May to mid-June. Because inserting these implants requires drilling into the tree (which could potentially harm the tree and/or open pathways for fungal infection), these products are not recommended for homeowner use. *Bonide Bullets* and *ACECAP 97 Systemic Insecticide Tree Implants* should be inserted by a certified arborist.
- **TREE-äge** (Emamectin Benzoate) is a promising new injectable chemical that has recently been approved for the systemic treatment of EAB in Wisconsin. It must be injected by a certified applicator.

Because the use of insecticides is fairly expensive, the long-term cost of annual treatments and each tree's general state of health should be considered before deciding to use this method. For trees on homeowners' lawns or for high-value publically owned trees, insecticides may be a reasonable option. As a Do-It-Yourself treatment, for example, *Bayer Advanced Garden Tree and Shrub Insect Control* formula costs around \$25 for 32 ounces (one ounce is required for every inch of circumference at the base of the tree's trunk). When treating only a handful of trees, this cost may be manageable. Over a larger scale, however, the costs of insecticide treatment add up quickly and the use of insecticides is likely to prove impractical over large areas containing many ash trees. For more information on the use of insecticides to control EAB, contact a certified arborist in your area (listed in Appendix E) or see [http://www.entomology.wisc.edu/emeraldashborer/EAB Homeowner Insecticide Guide Final 2008.pdf](http://www.entomology.wisc.edu/emeraldashborer/EAB_Homeowner_Insecticide_Guide_Final_2008.pdf).



Figure 21: Trunk Injection of Insecticide (Photo, David Cappaert)

Ash Reduction

EAB larvae eat phloem and xylem, the living tissues that circulate nutrients within a tree. These tissues are found directly beneath a tree's bark. The EAB population is limited by the amount of food available. If ash trees are removed, therefore, EAB populations will decline. Removing some ash is unlikely to prevent the EAB from infesting remaining trees, but it may reduce local population densities (McCullough and Siegert 2007).

Several ash reduction approaches are currently being discussed:

- **Infested ash removal:** This is the most common ash reduction strategy. Ash trees known to be EAB infested are felled and removed in order to eliminate a portion of the EAB population and slow its spread. Since an EAB infested tree *will* die (most likely within one to three years), removing infested trees eliminates a future public safety hazard. In addition, if cut when green, most EAB infested ash trees can be put to productive use, as described below in the Wood Disposal and Utilization section.
- **Large ash removal:** Large ash trees that are capable of harboring and feeding large numbers of EAB larvae are prioritized for early removal.
- **Cut and Leave:** Especially in woodland areas, felling ash trees and leaving them on-site may be more feasible than transporting them for utilization and/or disposal, but it is likely that a portion of the EAB larvae developing beneath the bark may still emerge as adults the following spring. This method is recommended only when access for transport is not feasible.

- **Herbicidal ash removal:** Ash trees are killed by applying a registered herbicide product in order to reduce the amount of available phloem. As with the previous method, some larvae are likely to emerge from the dead trees. This method is suggested for use only in cases where access to ash trees for felling is limited.
- **Preemptive removal:** Preemptive removal refers to the felling of ash trees prior to EAB infestation. If done at a sufficiently large scale, removing ash trees could theoretically limit EAB population growth by making host trees unavailable to dispersing adult beetles. Some municipalities in states with large EAB populations have conducted preemptive removals in order to lessen the strain on human resources and local budgets when EAB does arrive. Preemptive removal is not currently being recommended by DATCP or DNR, but individual municipalities have the option to consider this approach. State urban forestry experts suggest that municipalities begin by inventorying their ash and removing ash trees that are in poor health or condition. If you decide to conduct preemptive removals, focusing initially on smaller ash trees may be met with less public opposition.

Ash trees should be removed between October 1 and May 1, when the EAB is in its relatively immobile larval form beneath the bark. If at all possible, trees should be removed while they are still alive (green) because the cost and associated clean-up is much higher once a tree is dead. In addition, trees that are allowed to die standing may pose a public safety hazard.

While EAB infested wood may be transported and stored between October 1 and May 1, all wood must be **completely processed by May 1**. The following processing options are recommended to ensure complete destruction of EAB larvae and adults:

- *Chipping* to a maximum size of 1 inch in 2 diameters. **Note:** Small portable chippers may not be able to meet this specification. Chippers must be equipped with a 1” screen to ensure compliance.
- *Debarking*, including the removal of 1/2 inch of cambium. **Note:** The removed bark must be chipped to the above specifications or processed using another method.
- *Heat Treatment* in a specialized chamber or kiln to a core temperature of 160 degrees F for 75 minutes.
- *Composting* may be used as an additional treatment for bark and chips. Temperatures in the compost pile must reach 140 degrees F for four days and the compost must be turned after four days.
- *Burning* of wood, chips, or bark.
- *Aging* for two or more years following the death of the tree. Wood may **not** be moved out of a quarantined area during this period. This processing method is problematic because of the difficulty of enforcement if used for firewood.

Dane County recognizes that ash removal can be a major undertaking for local municipalities. Each community should weigh the available options and assess the nature

and location of its own ash resource as well as the local availability of the resources needed to implement ash reduction. In many cases, municipal public works personnel can be trained to conduct ash removal. The following organizations offer training on tree removal techniques and safety:

- FISTA (Forest Industry Safety and Training Alliance), <http://www.fistausa.org/>
- Arbormaster, <http://www.arbormaster.com/>

Sink Trees: Attract and Remove

Trees that are girdled are attractive to female EABs for oviposition. When the girdled “sink” tree is felled and removed, the larvae it contains are taken out of the population. It is currently unknown how effective this method is in reducing EAB populations; it is likely to have some beneficial results, but will not eliminate the EAB from a local area. This method can be used in combination with other methods such as insecticides and ash reduction.

A Combined Approach

In some cases, combining these methods may be the best option. For example, you may opt to treat a few prime ash trees with insecticides in perpetuity, remove some trees right away, and treat some trees for a few years before they are removed in order to distribute the costs of removal and replacement over several budget years. Some communities are finding that the temporary use of insecticides allows them to conduct the necessary removals over a longer period of time (i.e. 10 years instead of 2 years), which may cost less in the long-run because it eliminates the need for increased wood residue storage and processing capacity .

Figure 22 summarizes control and containment recommendations based on tree location, tree value, and costs associated with the various options just described.

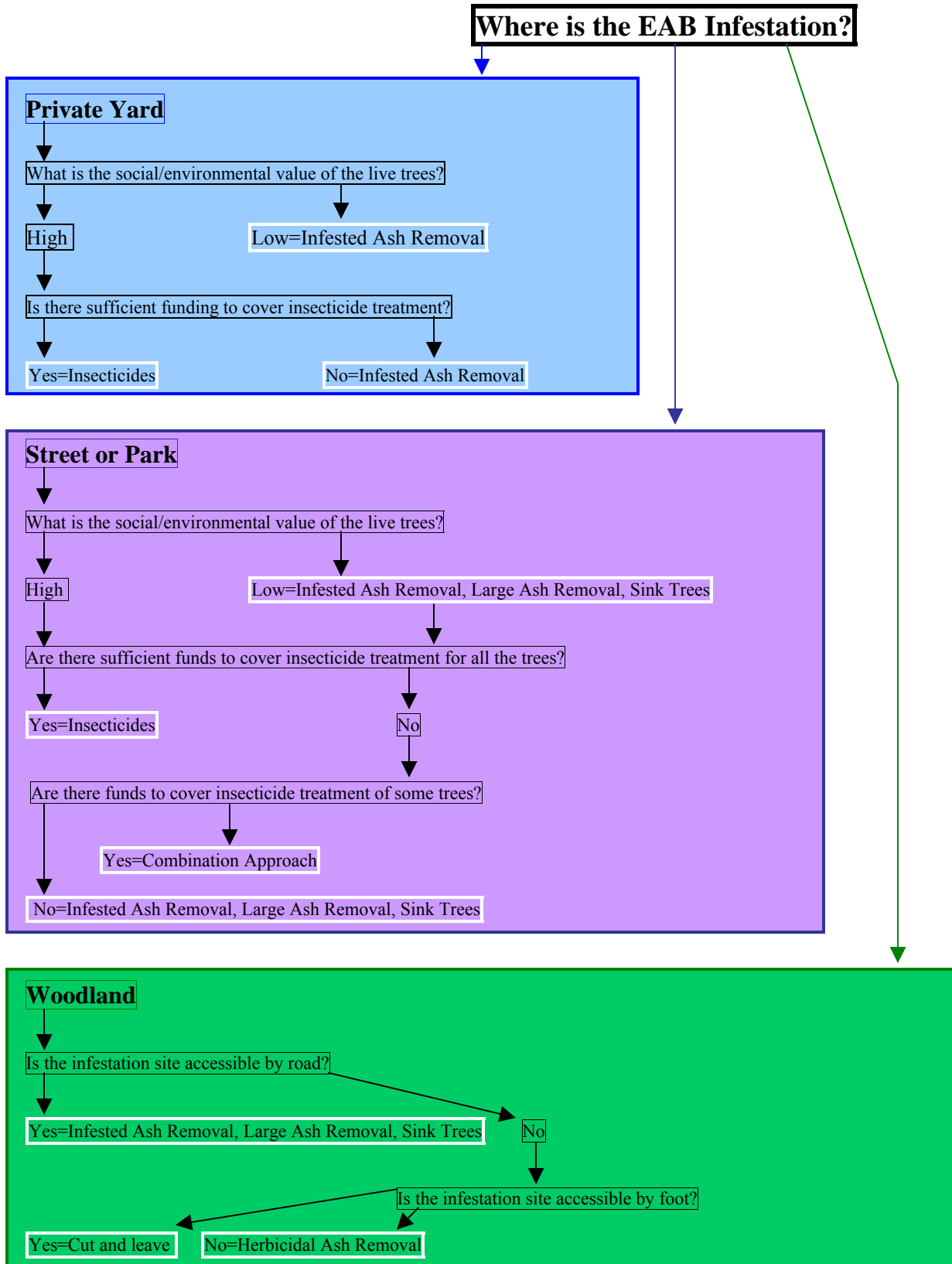


Figure 22: Summary of Control and Containment Recommendations

The following three strategies are not currently recommended for implementation at the local level, but are often discussed along with other EAB control and containment options:

Biological Control (No Practical Means)

At this time there is no practical local means for the use of biological controls, but this option is currently being investigated. The fact that the EAB lacks natural predators in North America is one of the keys to its rapid spread and destructive capacity. In Asia, several natural predators of the EAB limit populations. Logically, identifying and introducing these predators would help reduce—though probably not eliminate—EAB populations in infested areas. Ongoing research on the potential for biological control agents is being conducted. Because this control option is still in the research and development stage, Dane County can not currently recommend biological control at the local level, but intends to monitor developments in this area and keep local units of government updated.

So far, studies conducted in Michigan have identified a variety of native North American organisms (including parasitoids, predacious beetles, woodpeckers, and entomopathogenic fungi) that attack and kill the EAB. However, the predation and parasitism rates of these native natural enemies are very low and are unlikely to suppress existing EAB populations enough to save ash trees. Similar studies were also conducted in China, where the EAB is native. Only low-density EAB populations are found in China, where it is a periodic pest of ash. In China, EAB populations are most likely kept in balance by a combination of factors, including host plant resistance and natural enemies.

Based on studies in China, three parasitoids in the wasp family have been identified as potential biological control agents. Two larval parasitoids, *Spathius agrili* (Hymenoptera: Braconidae) and *Tetrastichus planipennis* (Hymenoptera: Eulophidae) show promise. One egg parasitoid, *Oobius agrili* (Hymenoptera: Encyrtidae) is also being considered. Studies indicate that the risk of non-target predation by these species is low and field releases of for all three species have been approved in Michigan. For more information on this project see:

http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab-biocontrol.pdf

Eradication (Special Situations Only)

In the recent past, eradication—the attempt to completely eliminate the EAB from a local area by removing all potential host trees—was widely recommended as an EAB control and containment strategy. The eradication method drew on case study research conducted in Michigan (*Dispersal of Emerald Ash Borer: A Case Study at Tipton, Michigan*, by D. McCullough, T. Poland and D. Cappaert). In this case, the research showed, more than 70 percent of EAB galleries occurred within 100 meters (0.06 miles) of an infestation source (a firewood pile). Further, gallery density decreased significantly as distance increased. It was believed that removing trees at 800 meters (0.5 miles) eliminated the most distant galleries. As a result, the eradication strategy that was

subsequently developed called for the removal of all ash trees within the EAB infested area as well as all ash trees within 1/2 mile of the outer edge of the infested area.

In the fall of 2008, an isolated find of EAB in Kenosha County was directly associated with newly planted nursery stock imported from Illinois. This small, contained infestation was successfully eradicated. In two other documented cases (one in Virginia and another in Michigan's Upper Peninsula), eradication proved successful. In most situations, however, it is suspected that implementation of the eradication method may actually force the spread of EAB because the adult beetles appear to travel much further than they would otherwise in search of food and suitable sites for egg deposition. Although eradication may be valuable for controlling newly discovered infestations with traceable origins at very small scales, this method is no longer widely recommended.

No Action (Not Recommended)

In some cases, a municipality or property owner may lack the resources to take proactive management action. In other instances, decision-makers may fail to grasp the magnitude of the problem before it's too late. If no action is taken to control and contain an EAB infestation, studies show that the rate of the invasive beetles' spread will be much faster than if control measures are put into place. For this reason, Dane County does not endorse taking no action in response to a local EAB detection.

Local EAB Control Ordinances

Dane County recommends that municipalities consider implementing local ordinances that 1) empower citizen monitoring through EAB education, 2) discourage the transportation of firewood into (and, if EAB is detected, out of) the immediate area, and 3) encourage responsible tree removal, handling, and processing practices. Your community may also wish to consider developing ordinances that provide local authority for EAB management and enable the declaration and abatement of public nuisance trees. The *Emerald Ash Borer Toolkit for Wisconsin Communities* contains examples of such ordinances that can be used as templates (partially reprinted in Appendix D of this plan). Sample ordinances can provide guidance, but communities should craft the language of their ordinances according to their specific needs and capabilities. Staff, budget, and enforcement ability vary widely and should be taken into account.

The City of Platteville has an ordinance on urban forestry that may provide a useful model. While this ordinance is not specific to EAB, it contains a provision that directs the city forester to maintain a public list of declared nuisances. This ordinance can be accessed at: <http://www.platteville.org/Portals/31/City%20Ordinances%206-3-8.pdf> (Chapter 10; Relevant sections include: 10.01(1)(h); 10.01(2); 10.03(2)(j); 10.07).

In some cases, ordinances developed to address Dutch Elm Disease may be amendable to include the EAB. The City of Madison, for example, has an ordinance that declares any tree infested with the Dutch Elm Disease fungus and/or the beetles that carry it a public nuisance, thereby requiring its removal (City of Madison Ordinance 20-34; see http://www.cityofmadisonsd.com/index.asp?Type=B_BASIC&SEC=%7B2CF9A4F0-5F4A-4B57-9256-3BD62671BE56%7D).

Wood Utilization Options

As a result of tree mortality and efforts to control and contain EAB infestations, the EAB has the potential to generate a significant amount of wood residue. In many ways, however, Wisconsin is better positioned to deal with the arrival of the EAB than other states that lacked the benefit of advance warning or guiding precedents. In Wisconsin, we will *not* confront thousands of ash trees dying simultaneously. We will *not* look upon streets lined with dead trees requiring immediate attention or towering piles of wood that must be disposed of. In addition, since Wisconsin has weighed the evidence and decided against conducting preemptive removals, our EAB experience will differ from that of other regions. Most likely, Dane County will experience a comparatively gradual pattern of EAB arrival and ash removal. What we *will* see is an increase in the number of trees requiring removal and the volume of wood to be processed that is in line with the percentage of ash in our municipal forestscapes. The increase will depend on several key variables:

- How many ash are present? How large are they?
- How many of these trees will be treated with insecticides? Indefinitely, or as a way to slow the pace of removal?
- What approach to ash removal will be taken? How quickly and aggressively will removal take place? Will removals be conducted preemptively in order to distribute the workload and expense over a longer period of time?

Recent history has shown that EAB infestations will, for the most part, have run their course within a few years, but improvements in wood residue processing prompted by the EAB's arrival can catalyze meaningful changes that will guide how we think about our communities' wood in the future. Unless public safety obliges immediate action, EAB infested ash trees should be removed between October 1 and May 1, when the insect exists only in its larval form and is relatively immobile. The following sections outline three alternatives for the processing and utilization of wood residue in Dane County.

Background Information and Research

In order to determine the best course of action, Dane County collected information about current wood disposal and utilization practices from municipalities and tree care professionals working in the private sector. The information shared by these key groups has been instrumental in guiding Dane County's approach to wood utilization planning.

Municipal Data

According to responses to a letter of inquiry dated September 18, 2008 and a follow-up phone survey conducted on October 20-21 of that year, Dane County municipalities currently manage their wood residue in the following manners:

Method	Number
Towns:	
Centralized Burning	3
Individual/Property-owner Burning	4
Chipping/Recycling	5
Mix of Burning and Chipping/Recycling	3
Villages and Cities:	
Chipping	9
Mix of Burning and Chipping/Recycling	5
No response or no data:	32

We found that many of Dane County’s larger and more urban municipalities—where the greatest amount of wood residue is produced—already have chipping programs in place and are able to reuse/recycle the resulting wood product. Rural municipalities currently use of a combination of chipping, burning (often in the form of firewood for individual residents) to deal with their wood residue.

Private Sector Data

Tree care professionals working in the private sector are also finding positive ways to utilize the wood residue they produce. On February 24, 2009 Dane County conducted a survey and facilitated roundtable discussions on this topic at its “EAB for Tree Care Professionals” workshop. Survey responses indicated that tree care businesses are producing an average of 5494 cubic yards each year. With roughly 50 such business serving the Dane County area, this means a total approaching 274,700 cubic yards annually. All told, while no single producer singlehandedly generates an enormous quantity of material, viewing the wood residue produced by arborists in the aggregate may reveal important market opportunities. Currently, Dane County arborists are utilizing wood residue in the following manners:

Method	Number
Firewood	34.8%
Municipal chipping/composting yard	24.5%
Private chipping/composting yard	18.6%
Lumber	9.5%
Used on-site by homeowner	7.8%
Agricultural uses	3.2%
Other	1.6%

As these figures show, a large percentage of material (43.1%) is going to chips and compost, processed both at municipal and privately operated yards. A significant amount of residue from removed trees is also being used as firewood (34.8%).

A number of factors influence where arborists choose to take their wood residue:

Factor	Collective Rank	Average
Convenience	1	1.73
Hauling/transportaiton costs	2/3	2.73
Customer relations	2/3	2.73
Tipping fees	4	3.36
Other	5	4.45

Convenience ranked foremost among these factors. As one respondent commented, arborists' trucks are full at 5pm and need to be empty the following morning, which often limits options for wood utilization. The next most critical factors were hauling/transportation costs and customer relations. Tipping fees, although always a consideration, tended not to be seen as a determining factor because anticipated fees are typically incorporated into customers' bills.

Arborists were also asked to rank the value-added options they are most likely to consider:

Value-Added Option	Collective Rank	Average
Mulch	1	2
Firewood	2	2.83
Compost	3	3.1
Lumber	4	3.5
Biofuel	5	4.42

Mulch ranked first due to ease and speed of processing. Firewood, often valued for home heating, ranked second. Compost, which is often produced by specialized processors, ranked third. Lumber, which ranked fourth, is viewed as a positive way to utilize wood, but individual access to mill operations varies significantly. While of interest, biofuel ranked in fifth place because biofuel users are not currently conveniently located in the Dane County area. This seems likely to change in the near future.

Our research indicates that Dane County municipalities, alone or in cooperation with private sector partners, will be well positioned to handle the expected increase in wood volumes that the EAB is likely to bring **if they take the proactive preparatory steps outlined in this plan**. As long as EAB quarantine regulations (see EAB Confirmation, Notification, and Mobilization, above) are followed, no additional changes in wood use practices are required. However, Dane County encourages its municipalities, local officials, and residents to embrace this opportunity to explore how to put “waste” wood to productive use and simultaneously recover some of the costs associated with tree removal, hauling, and processing. In cases of unforeseen surges in wood volume—whether caused by infestation or by storm damage—there may be a role for the County to play in coordinating a Wood Utilization Program that is able to mitigate the costs associated with tree removal, hauling, and processing by taking advantage of the economy of scale.

Option 1: No Change

Municipalities have the option to make no qualitative changes to their wood management procedures. Our research has shown that, especially if the spread of the emerald ash borer into Dane County is slowed by public education and other proactive management measures and municipalities are prepared for the EAB's arrival, local communities may be able to handle this invasive pest with little expense other than the costs of tree removal and replacement. If the volume of wood generated by local EAB infestations is deemed manageable, communities may continue to deal with wood residue as they did prior to the arrival of the EAB, provided EAB quarantine regulations and any relevant air quality and solid waste regulations are met. Although Dane County is striving to develop value-added uses for wood residue, burning has historically been a preferred method for dealing with infestations and storm damage. Communities considering burning should know that all wood residue falls within the statutory definition of either "solid waste" and/or "yard waste" and may be subject to regulation. These regulations contain exemptions related to burning and disposal of untreated and unpainted wood. Regulations for open burning are contained in state statutes NR 429.04 (Air Management Regulations) and NR 502.11 (Solid Waste Regulations) of the Wisconsin Administrative Code and can be accessed through the DNR's Open Burning Website: <http://dnr.wi.gov/environmentprotect/ob/>. For more information on solid waste regulations, contact Percy Mather, DNR Solid Waste Specialist for Dane County at (608) 275-3298 or mathep@dnr.state.wi.us.

Option 2: Independent Wood Utilization

Dane County encourages municipalities, local officials, and residents to independently explore how costs associated with removing, hauling, and processing wood residue could be recouped by channeling this wood into existing markets for value-added wood products.

Communities are urged to develop municipal Wood Utilization Yards capable of storing and processing EAB affected wood. As part of the planning process, think carefully about how the wood you collect will be used:

- Will it be chipped and sold or offered as mulch for residents?
- Are there other value-added options—such as lumber and biofuel—that may be rewarding for your community?

Municipalities should consider which value-added products may be best-suited to their type and volume of wood and may use the directory of South-Central Wisconsin Hardwood Processors (Appendix F) to locate potential buyers. Also consider how you will handle the wood residue that results from ash removals conducted on private lands. Will there be a disposal fee for wood residue that arrives at the yard? Or, might there be a way to recoup the costs of yard maintenance through value-added uses for wood products? Whatever you decide, keep in mind that if and when Dane County becomes quarantined, ash material that leaves the county must legally meet the specifications outlined in the Control and Containment section, above. Know how you will meet these specifications.

Even in small communities, finding value-added uses for ash is not without precedent. In some EAB-affected communities in Michigan, municipalities contracted directly with portable sawmill operators; sawmill operators gained an excellent source of sawlogs and, in exchange, a portion of the processed wood was returned to municipalities in the form of sideboards for municipal trucks, park benches, and/or street barricades. While tree tips and brush are obviously not suitable for sawing, many Dane County municipalities already have wood chipping programs in place. If the chips produced by these operations are high quality and free of debris, they can potentially be sold for mulch. Currently, many Dane County municipalities partner with a private-sector composting operation to dispose of their yard waste and wood residue.

For private property owners and municipalities that contract with arborists/tree services for tree removals, developing a positive working relationship with local arborists (see Appendix E) is a good place to start. Since winter is typically the slow season for tree service companies, it may be possible to negotiate an off-season or volume discount at exactly the time when EAB infested trees are recommended for removal. In most cases, arborists are responsible for disposing of the trees they remove. If value-added uses for this wood can be found that help their businesses' bottom-line and/or make their customers happy, it is likely that tree service companies will be highly receptive. Find out what arborists are doing with their wood and encourage communication between the arborists you hire and the wood processors (see Appendix F) in your area.

One factor that has frequently limited the ability of municipalities and arborists to make productive use of wood residue is a lack of equipment. If, for example, the equipment necessary to transport an eight foot saw log is not available, the log will be cut into small sections and/or chipped on site, resulting in a less valuable final product. The following pieces of equipment would enable these valuable logs to be transported for utilization:

- *Hand-Operated Logging Arches* elevate a log onto wheels for on-site movement. Available in various sizes; prices begin at \$145.
- *Towable Logging Arches* are designed to be pulled by ATVs or small tractors. They enable several logs to be moved at once; most cost between \$350 and \$450, (see Figure 23).
- *Small-Scale Logging Trailers* come in various sizes and are designed to be towed behind a tractor or pick-up truck. Mini Tractor Enterprises, located in Junction City, Wisconsin sells a variety of models. The "Wheeler," which can be towed behind a pick-up truck, begins around \$28,000 (see Figure 24). For more information, visit: <http://www.minitractor.net/>.



Figure 23: Logging Arch

(Photo: Eli Sagor)



Figure 24: "The Wheeler" Logging Trailer

(Photo: minitractor.net)

Because this equipment is expensive to purchase, participation in an equipment rental program may help overcome this limitation. Such a program could be run through an existing commercial rental service. Alternatively, if there is sufficient interest to support such a program, Dane County could consider purchasing this type of equipment to rent (at modest fees to cover the cost of upkeep) to residents, businesses, and local units of government within the County.

Municipalities are in touch with their own local needs and interests and know which options may be a good fit for them. For this reason, Dane County encourages local investigation, ingenuity, and decision-making in the area of wood utilization. *The Dane County Emerald Ash Borer and Wood Utilization Strategic Management Plan* serves a valuable informational role by providing contact information for arborists and wood users in our region (see Appendices E and F).

Option 3: The Dane County Wood Utilization Program

In some cases, unanticipated volumes of wood residue—whether attributable to infestation or storm damage—may prove unmanageable at a local level. The Dane County Wood Utilization Program is being proposed as a proactive emergency management protocol with the goal of finding value-added markets for wood residue that can recover the costs associated with hauling and processing. Wood residue from County properties will be handled according to protocols developed through this program. Dane County municipalities, utilities, and contractors may also participate if or when unforeseen volumes of wood residue occur. Economy of scale principles may make the Wood Utilization Program a cost-effective means of wood residue disposal; the combined volume of wood from several municipalities and various County properties is likely to fetch higher prices than any one entity—with only a few trees to sell at a given time—could singlehandedly generate. As the following sections describe, Dane County is currently investigating options for materials and handling procedures; wood utilization yard criteria, locations, and operations; and value-added markets for wood residue.

Materials and Handling Procedures

Dane County currently accepts yard waste for its compost program at three locations (see http://www.co.dane.wi.us/pwht/recycle/compost_sites.aspx). The County Wood Utilization Program would result in two additional, parallel material streams: one for logs destined for saw mills and another for tree tips and brush to be chipped. **Please note:** The County composting sites are *not* at present set up to take wood residue. The County is investigating potential sites to coordinate wood drop-off, sorting, and utilization (see Wood Utilization Yards, below).

Most likely, Dane County's wood products will go to different buyers with very different materials requirements. In order to ensure a high market value, therefore, the two streams of wood residue—logs/boles and crowns/brush—should be kept as separate as possible. The following general procedure for wood processing and hauling is recommended:

1. Trees should be removed green and handled without delay.
2. Logs/boles should be separated from crowns/brush immediately. In most cases, this separation can take place *during* the tree removal process.
3. Make sure the material is clean. No garbage, plastic, or metal and as little dirt as possible should make its way into the material stream.
4. Logs may be cut to specific dimensions depending on their ultimate destination and the needs of buyers. Since a longer log can always be shortened and has a greater number of potential uses, retaining as much length as possible is good practice.
 - The optimal length for saw mills is 10'6" to 12'6," with a minimum diameter of 10." Logs over eight feet in length, however, may become impractical to transport. As a result, 8'8" is a common standard length for saw logs. **Note:** Logs used for pulp can be as small as 4" inside bark; in addition, chips can be used for pulp.
5. Tips and brush can either be chipped on-site or hauled as is. If a chipper is available, it may prove most cost-effective to chip before hauling because of the greater volume of chips that can transported per truckload.
6. Logs/boles and brush/crowns/chips should be hauled to Wood Utilization Yards separately.

Wood Utilization Yards

Dane County is working to identify and evaluate potential Wood Utilization Yard sites. Designating such sites will enable the County to handle “surges” in wood residue volume following widespread infestations and damaging storms. In addition, these sites would facilitate the recycling and utilization of wood residue in an efficient and orderly manner. Dane County is considering the following issues and options related to the establishment of Wood Utilization Yards:

- In order to ensure that yards are easily and equitably accessible—and to reduce the risk of spreading the EAB *within* Dane County—the establishment of more than one Wood Utilization Yard will be necessary. Three or four sites may be designated on Dane County Parks properties. Dane County Parks may also consider acquiring lands for this purpose adjacent to existing parks; when the yard is no longer needed, the land could be converted to a public use and/or conservation area.
- Wood Utilization Yards may be operated according to a rotating schedule, adjusted in response to local need. A timetable for chipping that assigns specific dates of operation to each site would allow costly equipment to be shared and would notify adjacent property owners when to expect increased activity at the site.
- In order to prevent misuse in the form of inappropriate dumping and the removal of materials, Wood Utilization Yards must be secure sites. Fencing, signage, and/or regular staffing may be required.
- Dane County must determine whether its Wood Utilization Yards will be operated by the County itself or by private-sector contractors. If the latter, partnerships with contractors will need to be established through open bidding processes.
- Although Dane County hopes to offer wood residue disposal free of charge and/or to reimburse users for the costs of hauling materials to the site, there is at present no funding for yard operation. If a tipping fee must be charged to cover the costs of yard operation, fee schedules will encourage the recommended wood handling procedures outlined in the previous section and will be made as affordable as possible.

Wood Utilization Yard Selection Criteria

DATCP and DNR have not established standards for EAB marshalling or utilization yards. Dane County has been encouraged to develop site selection criteria that will be used to identify promising yard locations within the County and may also serve to guide the selection and development of Wood Utilization Yards elsewhere. Based on current USDA-APHIS and DATCP guidelines, EAB quarantines in the state of Wisconsin will be enacted at the county level. Wood Utilization Yards, therefore, can legally be located any distance from the point of wood origin, as long as they remain within Dane County. Based on conversations with experts at DATCP and DNR, as well as conversations with marshalling yard operators and overseers in Michigan, Dane County proposes the following Wood Utilization Yard selection criteria:

1. The site should be located away from residential areas where noise, dust, and debris would be disruptive.
2. The site should have a sufficiently large holding area to accommodate surges in the volume of wood residue (caused by infestations and storm casualties). It should also be large enough to include a buffer zone at its external edges. Dane County is currently considering sites of at least 20 acres.
3. The site should be easily accessible by major highways.
4. In order to limit the spread of new infestations, the site should not be adjacent to densely forested areas (*note*: this is only a concern if EAB infested trees are cut and brought to the yard during the adult EAB beetles' flight period).
5. Multiple sites should be identified throughout Dane County in order to limit transportation costs, ensure equitable access, prevent the further spread of EAB, and handle surges in wood volume.
6. Wood utilization yards must conform to local land use restrictions and cannot be located in wetland areas.

Necessary Operating Licenses and Zoning Concerns

According to current solid waste regulations, no program approval or license is needed if the wood accepted (either as logs or chipped) at Wood Utilization Yards is to be transported for use as mulch, compost, boiler fuel, landfill cover, or other purposes. Similarly, if wood is temporarily stored in a nuisance free and environmentally sound manner for transfer elsewhere, no license is required. However, if the construction of a Wood Utilization Yard disturbs one or more acres (if, for example, the area must be cleared to accept wood), a construction site storm water permit (under NR 216 of the Wisconsin Administrative Code) may be needed.

Wood Utilization Yards must take zoning into consideration. Zoning for Wood Utilization Yards is likely to be comparable to zoning for recycling centers. The best zoning district for this type of land use—material is delivered to the site and moved/processed outdoors by mechanical means—is Agricultural-2. It is probable that once a site is selected, the zoning district for the property will need to be amended and a Conditional Use Permit (CUP) will need to be obtained from the Dane County Office of Planning and Development that addresses hours and/or dates of operation, traffic

patterns, and activities. Since obtaining the necessary zoning amendments and the CUP may take several months, three to four months will be allowed for this process. As part of the site selection process, Dane County will consult with the affected municipalities to ensure their needs and concerns are addressed. Future potential uses of selected sites will also be taken into account.

Potential Wood Utilization Yard Operations

If needed, Wood Utilization Yards will be set up to accommodate several ongoing and concurrent processes:

- Yards will receive wood from County properties, as well as from Dane County municipalities, private residents, and tree services. In order to ensure maximum marketability, materials should arrive at yards as specified in the Materials and Handling Procedures section, above.
- Yards will function as staging areas for wood processing. The different types of material received will be carefully sorted for further processing according to their best possible use and probable buyers.
- Yards will serve as temporary storage sites for wood and wood products awaiting processing, purchase, and transport for utilization.
- Marketable lumber will be sorted by size and quality and sold through an advertised bidding process. If sufficient quantities of wood and market interest is demonstrated, bidding may occur at regularly designated intervals (for example, on the first Friday of each month).
- Wood that is not usable for lumber will likely be chipped on-site. Chipped material could be used by local units of government for trail and park maintenance, offered to County residents, or sold for biofuel. Sales of chipped material to biofuel manufacturers and/or users could be arranged using an annual bidding process in response to a prospectus delineating the anticipated volume of available chips.
- If wood chips are destined for use as biofuel, it may be plausible to initiate the drying process (necessary for processing chips into pellets) on-site.
- If necessary, the debarking of wood in preparation for shipment outside of a quarantined area could also take place at yards.
- Wood Utilization Yards can also play a regulatory role; the existence of a centralized collection site for EAB affected wood allows regulators to efficiently conduct required inspections.

Dane County recommends and is investigating funding options for a demonstration project that would enable further investigations into wood yard operations and design.



Figure 25: Removed Ash Stacked for Utilization
(Photo: Pennsylvania Department of Conservation and Resources)

Operations Equipment

Because the Dane County Wood Utilization Program would process wood according to its ultimate use, the specific equipment required at Wood Utilization Yards depends on the materials received and the demands of the market. It seems likely that a chipper and front-end loader and/or grapple will be among the initial equipment needs. Debarking, which may also take place at yards, requires additional specialized equipment.

- *Chipper.* A large chipper/grinder capable of quickly producing chips that meet the specification of 1” in 2 diameters is a major investment, with cost estimates in the vicinity of half a million dollars. Chippers are available through a variety of manufactures (see Appendix G).
- *Front-End Loader and/or Grapple.* A front-end loader or grapple is necessary to sort and stack wood products as well as to place material in position for chipping. Estimates for the purchase a single front-end loader or grapple range between \$200,000 and \$250,000.
- *Debarker.* Morbark makes debarking equipment that can handle logs up to 22” in diameter (see <http://www.morbark.com/AboutMorbark/AboutMorbark.htm>).

In addition to major operations equipment, Wood Utilization Yards will require site maintenance supplies, fencing and signage, and safety and communications items.

Dane County Tree and Ash Density

In order to determine the best possible locations for Dane County’s Wood Utilization Yards, the six criteria listed above were combined with data on the density of ash and other trees in order to identify potential Wood Utilization Yard locations. County tree inventory data, municipal tree inventory data (where available), and estimates of total numbers of trees and numbers of ash based on woodland and residential acreages were used to identify areas with the greatest probable need.

County Park Data

Dane County has undertaken a survey of trees—including tree species and diameter range—on County-owned lands using Geographic Position System (GPS) and Geographic Information System (GIS). This tree inventory is now complete and is currently undergoing quality assurance review. As Table 2 shows, Dane County is responsible for the maintenance of 5,315 landscape trees, of which 974 (18.3%) are ash. Figure 26 gives a visual overview of these County-owned trees' locations.

Table 1: County-owned Landscape Trees and Ash, by Location

Location	Total # of Trees	Total # of Ash	% of Ash in County-owned Landscape Trees
Alliant Energy Center	663	188	28.4%
Babcock County Park	265	54	20.4%
Badger Prairie County Park	247	52	21.1%
Brigham County Park	759	119	15.7%
Cam-Rock County Park	139	16	11.5%
Donald County Park	24	-	-
Festge County Park	138	-	-
Fish Camp County Park	42	31	73.8%
Fish Lake County Park	39	4	10.3%
Goodland County Park	382	19	5.0%
Halfway Prairie School	12	2	16.7%
Indian Lake County Park	75	7	9.3%
Jenni & Kyle Preserve	19	-	-
LaFollette County Park	76	8	10.5%
Lake Farm Centennial State Park	434	102	23.5%
Lake View Hill County Park	293	33	11.3%
Lussier County Park	13	-	-
McCarthy Youth & Conservation County Park	47	-	-
Mendota County Park	343	93	27.1%
Prairie Moraine County Park	14	-	-
Riley-Deppe County Park	146	34	23.3%
Salmo Pond County Park	16	-	-
Schumacher Farm	74	17	23.0%
Stewart County Park	74	2	2.7%
Token Creek County Park	913	169	18.5%
Viking County Park	50	24	48.0%
Yahara Heights County Park	18	-	-
Total	5315	974	18.3%

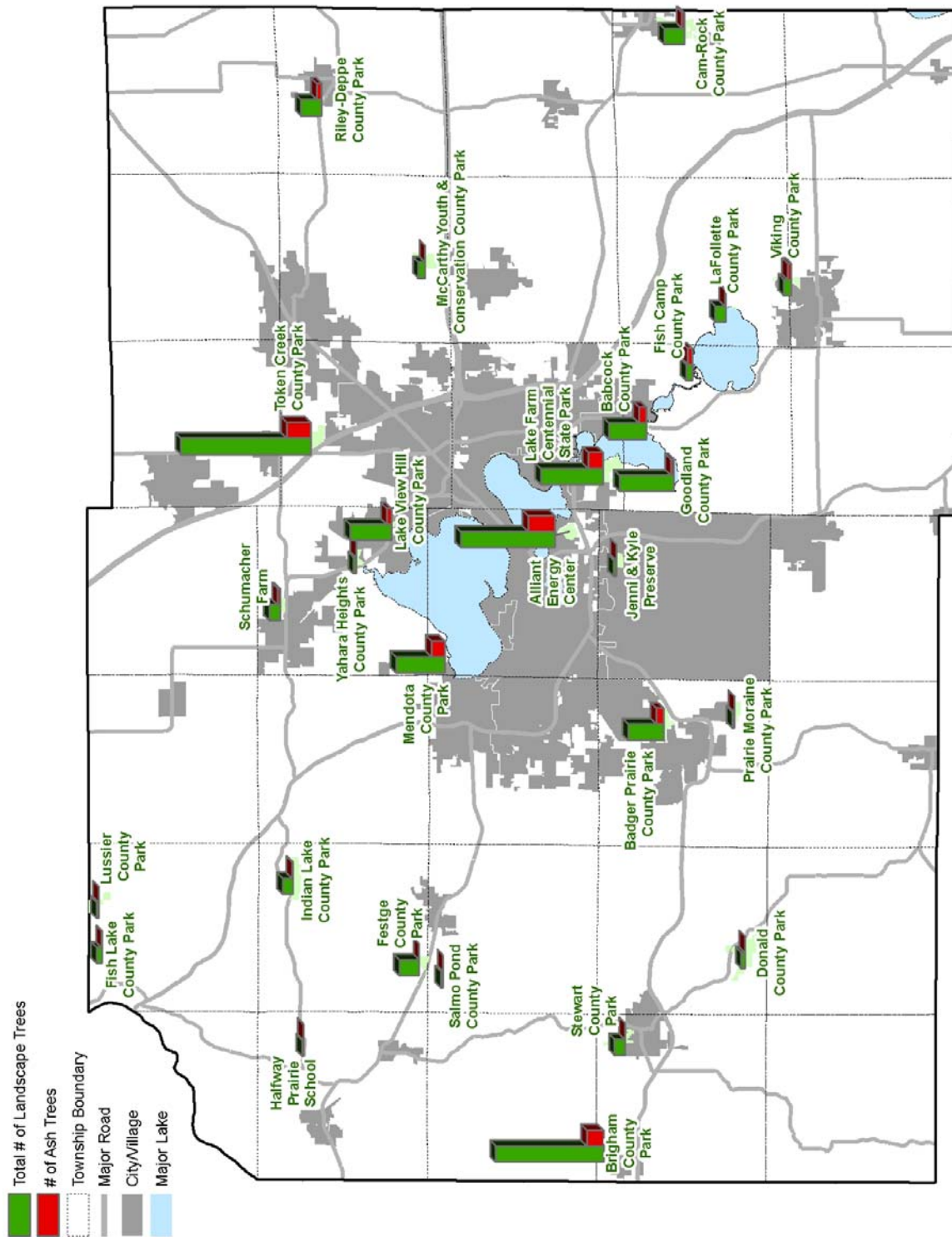


Figure 26: County-owned Landscape Trees and Ash

Municipal Tree Inventories

In order to assemble information on municipally-owned park and street (MOPS) trees within Dane County, the Parks Division sent letters asking for this information in May and again in September of 2008 (see Appendix I). Contact information for town, village, and city clerks compiled by the Dane County Clerk's Office was utilized. Letters outlined Dane County's EAB planning project, why municipal tree inventory data were desired, and specified the type of information to be sent. In order to confirm that no response to the letters meant that no data existed, follow-up calls to each municipality that had not submitted data were conducted in October of 2008.

Dane County received tree inventory data from 18 of the County's 61 municipalities, summarized in Table 3 and Figure 27. Many municipalities, it must be noted, do not currently have tree inventory data; some communities have an inventory on progress but do not yet have data and some are now initiating the tree inventory process.

Table 2: Municipal Tree Inventory Data

Entity	Total # of MOPS Trees	Total # of MOPS Ash	% of Ash in MOPS Trees
Town of Cottage Grove	-	18	-
Town of Madison	1,628	155	9.5%
Village of Belleville	86	22	25.6%
Village of Cambridge	574	103	17.9%
Village of Cottage Grove	2,263	436	19.3%
Village of Deerfield	1,017	201	19.7%
Village of Deforest	3,587	455	12.7%
Village of Marshall	1,000	200	20.0%
Village of McFarland	3,318	555	16.7%
Village of Mount Horeb	3740	425	11.4%
Village of Shorewood Hills	3,325	260	7.8%
City of Fitchburg	2,126	204	9.6%
City of Madison	105,000	31,500	30.0%
City of Middleton	9,183	2,493	27.1%
City of Monona	4,577	915	20.0%
City of Stoughton	4,485	813	18.1%
City of Sun Prairie	8,307	1,896	22.8%
City of Verona	1,793	355	19.8%
Total	156,009	42,006	26.3%

Notes on Table 3:

MOPS=Municipally-owned Park and Street Trees.

Dash (-) indicates data not available.

City of Madison provided a rough estimate of street trees and estimates that 30% of street trees are ash.

City of Monona includes both park and street trees (removed species = 001 from count as these are vacant).

City of Sun Prairie includes both park and street trees (removed spp = stump, unknown, or any vacant sites).

Town of Madison ash estimate includes green ash only.

Town of Cottage Grove has a partial tree inventory (18 park ash).

Village of Mt. Horeb has a partial tree inventory (425 street and park ash).

Village of Belleville has a tree inventory of park but not street trees.

Village of Marshall has no formal tree inventory but provided estimates.

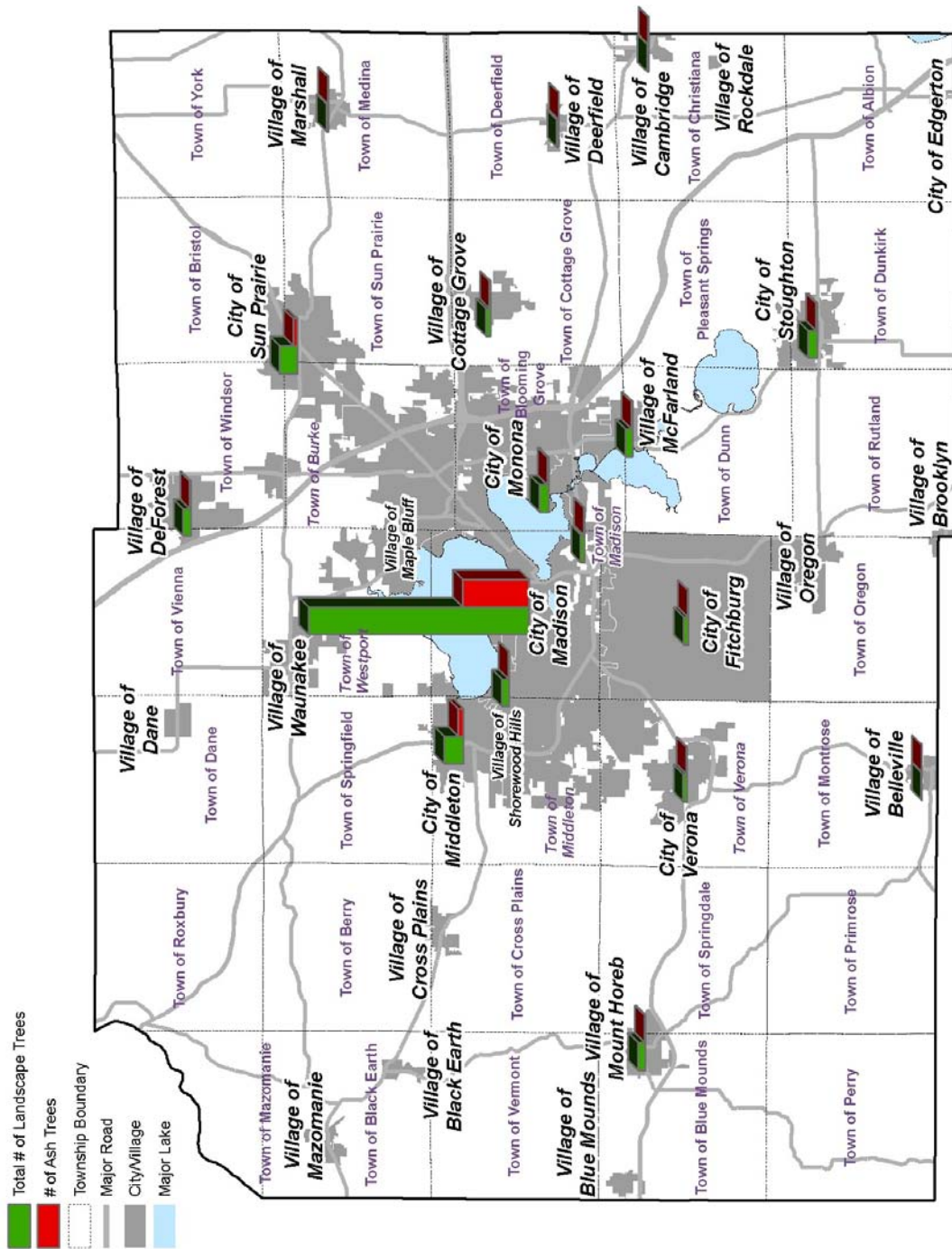


Figure 27: Municipal Tree Inventory Data

Woodland Areas

Ash is less prevalent in woodland areas—defined as lands that have 80% or more tree canopy—than in our urban forests. But, according to Forest Inventory Analysis data from the USDA Forest Service Northern Research Station, ash makes up an estimated 2.1% of Dane County’s forest trees. (In Wisconsin as a whole, this figure is higher; the DNR estimates that 6.8% of trees in Wisconsin’s woodlands are ash). DNR WISCLAND and CARPC (Capital Area Regional Planning Commission) data show that the western portion of Dane County has a greater amount of woodland—and, therefore, a greater amount of ash—than the more easterly portions of the County (see Table 4 and Figure 28).

Table 3: Estimated Trees and Ash in Dane County Woodlands

Entity	CARPC Woodland (Acres)	Estimated # of Woodland Trees (442 trees per acre)	Estimated # of Woodland Ash (2.1% of total trees)
Town of Albion	1944.9	859645.8	18052.56
Town of Berry	7501.7	3315751	69630.78
Town of Black Earth	4710.6	2082085	43723.79
Town of Blooming Grove	337.1	148998.2	3128.962
Town of Blue Mounds	4871.5	2153203	45217.26
Town of Bristol	557.5	246415	5174.715
Town of Burke	676.3	298924.6	6277.417
Town of Christiana	2428.9	1073574	22545.05
Town of Cottage Grove	1485.7	656679.4	13790.27
Town of Cross Plains	6218.4	2748533	57719.19
Town of Dane	3552.2	1570072	32971.52
Town of Deerfield	2824.9	1248606	26220.72
Town of Dunkirk	1422.2	628612.4	13200.86
Town of Dunn	2069.3	914630.6	19207.24
Town of Madison	23.2	10254.4	215.3424
Town of Mazomanie	6383.7	2821595	59253.5
Town of Medina	2150	950300	19956.3
Town of Middleton	1984.3	877060.6	18418.27
Town of Montrose	3086.7	1364321	28650.75
Town of Oregon	2251.1	994986.2	20894.71
Town of Perry	4844.7	2141357	44968.51
Town of Pleasant Springs	1976.6	873657.2	18346.8
Town of Primrose	4112.4	1817681	38171.3
Town of Roxbury	6699.2	2961046	62181.97
Town of Rutland	1863.4	823622.8	17296.08
Town of Springdale	4689.7	2072847	43529.8
Entity	CARPC	Estimated # of	Estimated # of

	Woodland (Acres)	Woodland Trees (442 per acre)	Woodland Ash (2.1% of total trees)
Town of Sun Prairie	1115	492830	10349.43
Town of Vermont	11094.5	4903769	102979.1
Town of Verona	2273.6	1004931	21103.56
Town of Vienna	884.8	391081.6	8212.714
Town of Westport	780.9	345157.8	7248.314
Town of Windsor	444.6	196513.2	4126.777
Town of York	1489.8	658491.6	13828.32
Village of Belleville	63.2	27934.4	586.6224
Village of Black Earth	44.1	19492.2	409.3362
Village of Blue Mounds	52.3	23116.6	485.4486
Village of Brooklyn	6.5	2873	60.333
Village of Cambridge	77	34034	714.714
Village of Cottage Grove	126.7	56001.4	1176.029
Village of Cross Plains	222.9	98521.8	2068.958
Village of Dane	2.9	1281.8	26.9178
Village of DeForest	59.9	26475.8	555.9918
Village of Deerfield	158.8	70189.6	1473.982
Village of Maple Bluff	0	0	0
Village of Marshall	36.7	16221.4	340.6494
Village of Mazomanie	163	72046	1512.966
Village of McFarland	87.4	38630.8	811.2468
Village of Mount Horeb	152.2	67272.4	1412.72
Village of Oregon	36.5	16133	338.793
Village of Rockdale	26.2	11580.4	243.1884
Village of Shorewood Hills	15.1	6674.2	140.1582
Village of Waunakee	81.6	36067.2	757.4112
City of Edgerton	7.9	3491.8	73.3278
City of Fitchburg	2253.5	996047	20916.99
City of Madison	2502.5	1106105	23228.21
City of Middleton	311.8	137815.6	2894.128
City of Monona	8.4	3712.8	77.9688
City of Stoughton	74.2	32796.4	688.7244
City of Sun Prairie	138.5	61217	1285.557
City of Verona	140.3	62012.6	1302.265
Total	107275	47,415,550	995,726.6

Notes on table 4:

The USDA Forest Service's Forest Inventory Mapmaker estimates that there are 442 trees per acre in Dane County woodlands. Of these, 2.1% are ash.

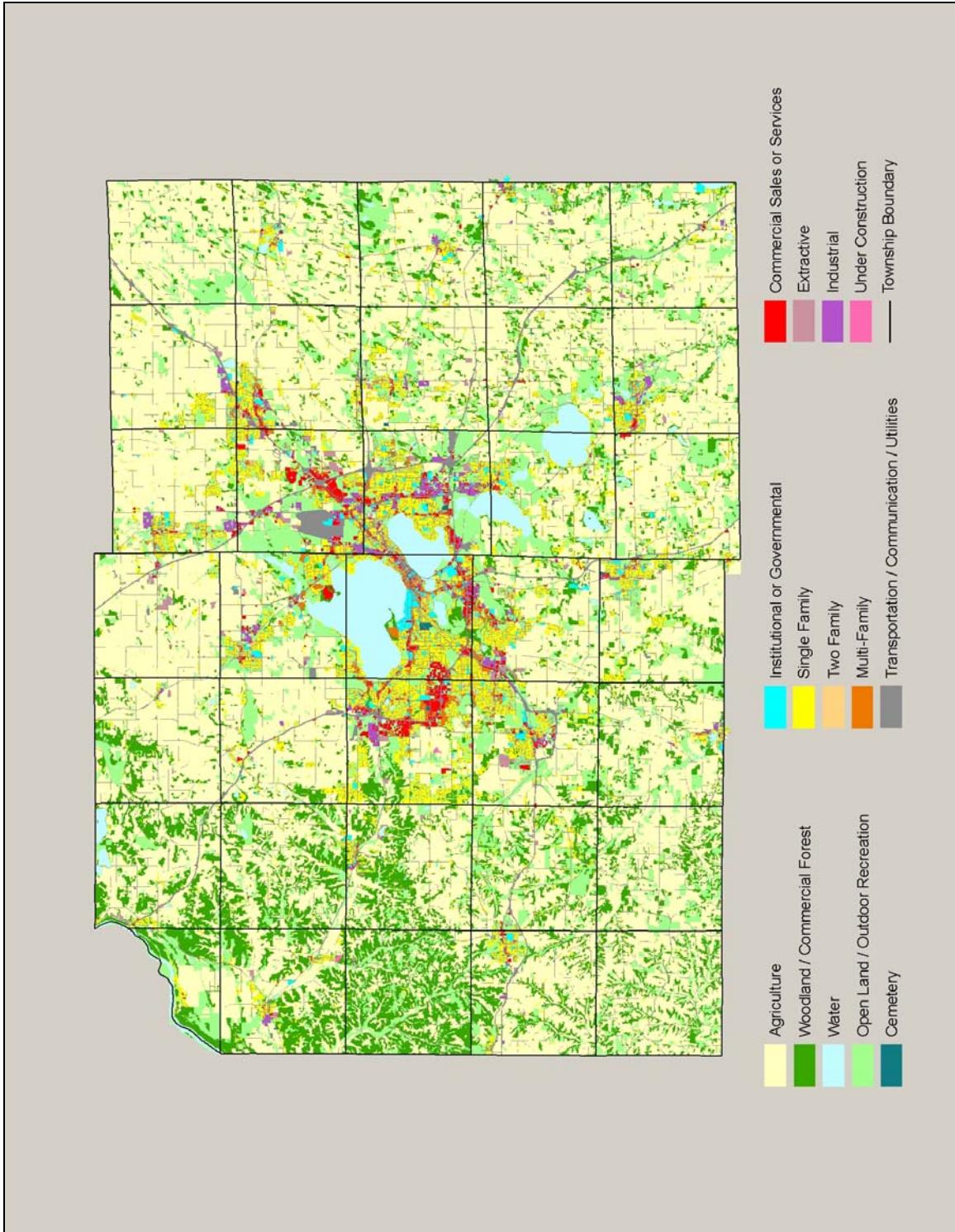


Figure 28: Dane County Land Cover
Data from the Capital Area Regional Planning Commission (2005)

Privately Owned Trees

Ash is a common planting in private yards and landscaping. While an exact number of privately owned ash is currently unattainable, a rough estimate of the number of ash trees on private property within Dane County municipalities was reached by combining CARPC residential acreage and the percentage of municipally owned park and street ash in each municipality (see Table 5).

Table 4: Estimated Trees and Ash in Dane County Residential Areas

Entity	CARPC Residential Areas (Acres)	Estimated # of Residential Trees (63 trees per acre)	Residential Ash Estimate (26.3 % of total trees)
Town of Albion	674.9	42518.7	11182.42
Town of Berry	525.3	33093.9	8703.70
Town of Black Earth	349.2	21999.6	5785.89
Town of Blooming Grove	314.8	19832.4	5215.92
Town of Blue Mounds	361.2	22755.6	5984.72
Town of Bristol	1108	69804	18358.45
Town of Burke	1097.4	69136.2	18182.82
Town of Christiana	428.7	27008.1	7103.13
Town of Cottage Grove	1395	87885	23113.76
Town of Cross Plains	723.3	45567.9	11984.36
Town of Dane	389.8	24557.4	6458.60
Town of Deerfield	668.1	42090.3	11069.75
Town of Dunkirk	1218.1	76740.3	20182.70
Town of Dunn	1671.6	105310.8	27696.74
Town of Madison	316.7	19952.1	5247.40
Town of Mazomanie	784.9	49448.7	13005.01
Town of Medina	529.1	33333.3	8766.66
Town of Middleton	2462.7	155150.1	40804.48
Town of Montrose	409.4	25792.2	6783.35
Town of Oregon	1303.1	82095.3	21591.06
Town of Perry	222.2	13998.6	3681.63
Town of Pleasant Springs	1051.2	66225.6	17417.33
Town of Primrose	210.6	13267.8	3489.43
Town of Roxbury	591.5	37264.5	9800.56
Town of Rutland	1096.6	69085.8	18169.57
Town of Springdale	1130.7	71234.1	18734.57
Town of Springfield	1168.8	73634.4	19365.85
Town of Sun Prairie	833.5	52510.5	13810.26
Town of Vermont	307.6	19378.8	5096.62
Town of Verona	1355.6	85402.8	22460.94
Town of Vienna	555.2	34977.6	9199.11
Town of Westport	1134.2	71454.6	18792.56

Entity	CARPC Residential Areas (Acres)	Estimated # of Residential Trees (63 trees per acre)	23837.82
Town of York	202.7	12770.1	3358.54
Village of Belleville	185.4	11680.2	3071.89
Village of Black Earth	147.4	9286.2	2442.27
Village of Blue Mounds	119.8	7547.4	1984.97
Village of Brooklyn	89.9	5663.7	1489.55
Village of Cambridge	155.1	9771.3	2569.85
Village of Cottage Grove	543.7	34253.1	9008.57
Village of Cross Plains	347.9	21917.7	5764.36
Village of Dane	113.1	7125.3	1873.95
Village of DeForest	236.6	14905.8	3920.23
Village of Deerfield	764.3	48150.9	12663.69
Village of Maple Bluff	265.1	16701.3	4392.44
Village of Marshall	333.7	21023.1	5529.08
Village of Mazomanie	209.1	13173.3	3464.58
Village of McFarland	739	46557	12244.49
Village of Mount Horeb	670.1	42216.3	11102.89
Village of Oregon	806.8	50828.4	13367.87
Village of Rockdale	29.4	1852.2	487.13
Village of Shorewood Hills	204.5	12883.5	3388.36
Village of Waunakee	921.2	58035.6	15263.36
City of Edgerton	1	63	16.57
City of Fitchburg	2546.6	160435.8	42194.62
City of Madison	13544.2	853284.6	224413.85
City of Middleton	1339	84357	22185.89
City of Monona	747.9	47117.7	12391.96
City of Stoughton	1913.6	120556.8	31706.44
City of Sun Prairie	2183.4	137554.2	36176.75
City of Verona	850.6	53587.8	14093.59
Total	58,038.8	3,656,444	961,644.9

Notes on Table 5:

The DNR's Urban FIA study estimates that residential areas have 63 trees per acre.

The average percentage ash within Dane County Municipalities—26.3%—was used to obtain a rough estimate of the number of ash in residential areas.

In order obtain a more comprehensive picture of the locations of rural and urban ash in our communities, the Dane County Land Information Office—in partnership with the Dane County Land and Water Resources Department, the City of Fitchburg, the City of Madison, and the City of Sun Prairie—plans to acquire Color Infrared (IR) imagery (generated in August of 2008). Beginning in January of 2009, the City of Fitchburg will conduct an experiment to determine if ash trees can be identified using new imaging and computing technologies. Working under a DNR Urban Forestry Grant, Fitchburg's project is the first test designed to ascertain the viability of using Color IR to inventory not only municipally-owned ash trees, but also privately-owned and woodland ash within its city limits. This type of data may have potential countywide applications and could

encourage additional—and more detailed—gathering of multispectral imagery to produce a fuller understanding of the nature of our ash resource and to evaluate gypsy moth, oak wilt, and other terrestrial invasive species management programs.

Summary

Based on the various sources of tree inventory data examined as a part of the planning process, it appears that the need for wood utilization yards is likely to be greatest in the central, urbanized portion of Dane County. While ash in Dane County woodlands is especially significant in the western portion of the County, the high percentage of ash in the City of Madison and surrounding communities—as well as the immediate need to deal with infested trees in densely populated areas—means that the most logical locations for wood utilization yards will be in central Dane County.

Possible Site Locations

Many possible sites for Wood Utilization Yards exist within Dane County. As part of the yard location process, the County will look to its own lands as well as consider acquiring lands adjacent to sites it currently owns and/or partnering with private landowning entities. Based on the location of inventoried trees within Dane County, the need for yards is likely to be greatest within the broad areas circled in Figure 29. The yard selection criteria outlined above will be applied within these areas.

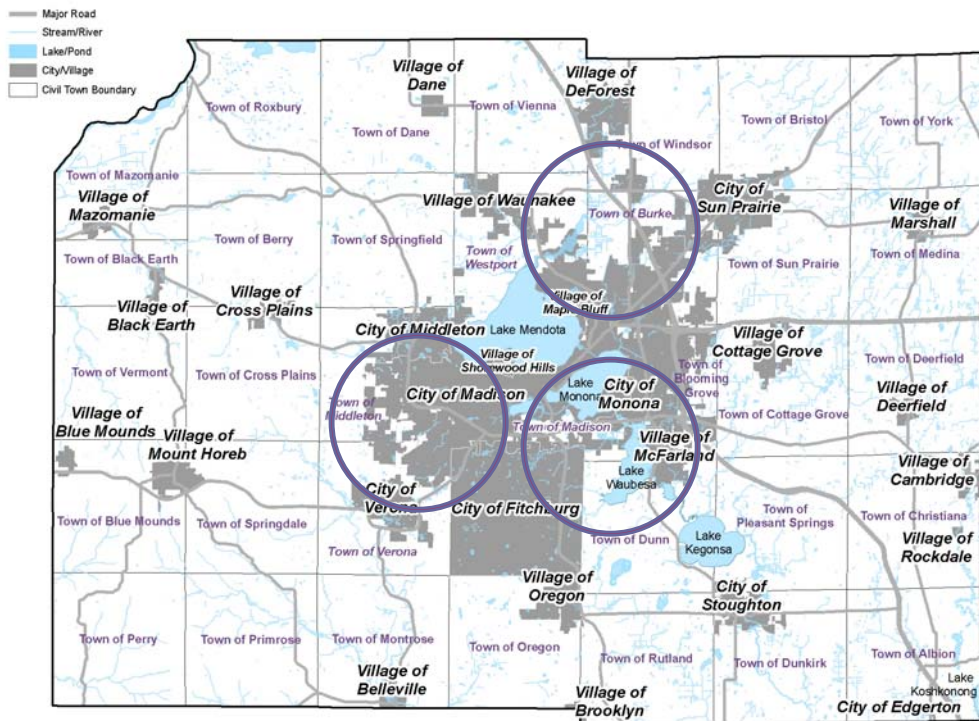


Figure 29: Map of Possible Wood Utilization Sites

Value-Added Options for Wood Utilization

Dane County is enthusiastic about finding ways to benefit the County's residents and local governments by developing economically and environmentally sound ways to dispose of the wood residue that results from infestations, storm events, and routine tree maintenance, but the County has no interest in functioning as a for-profit wood products broker. Where possible, Dane County will foster the private sector's capacity to develop markets for the utilization of wood residue. Alternatively, Dane County may establish contractual relationships with multiple private-sector companies based on transparent and open bidding processes. As the Dane County Wood Utilization Program is implemented, steps will be taken to ensure that the County program supports industry in southern Wisconsin.

Several promising value-added markets exist for reclaimed wood products. Dane County hopes to tap into these existing—and expanding—markets in order to make the disposal of removed trees in Dane County not only economically productive, but also environmentally friendly.

Lumber

Ash produces a quality hardwood lumber. According to experts at the United States Forest Service's Forest Products Laboratory, ash is currently rising in popularity and price. It is commonly used as a substitute for oak in furniture production and cabinetry. A wide variety of products—including paneling, flooring, moldings, pallets, and railroad ties—can be manufactured from ash. High quality white ash has long been the favored wood for baseball bats. Manufacturers have also used ash to produce picnic tables, bleacher seating, tree and survey stakes, sideboards for trucks, and handles for tools like hammers and rakes. In the case of mature trees killed by EAB, a specialty market may exist for “sentimental” wood products. For further information on local processors of ash and other hardwoods, see Appendix F.

Removed ash trees can be milled on-site using a portable sawmill. They may also be transported to a Wood Utilization Yard or to a mill located within the quarantined area without any additional processing. If the purchasing mill is located outside of the quarantined area, ash logs may be transported between October 1 and May 1 (with the provision that the wood will be completely processed by May 1) or, alternatively, wood may be debarked before shipment. **Note:** If logs are to be used for lumber, they should be cut to a minimum length of 8'8.”



Figure 30: Ash Lumber, with Ash Borer Damage (Photo: James Solomon, USDA Forest Service)

Biofuel

The market for woody biomass (as for other types of usable organic biomass) is growing quickly due to the high cost of non-renewable energy sources and the drive to find renewable and sustainable ways to provide power to consumers. In some cases, large wood burning boilers may be able to accept clean wood chips without further processing. Chipped and dried wood can also be pelletized for more efficient use in industrial boilers; it is likely that pellet manufacturers will be among the major purchasers of Dane County's chipped wood. Common sources of chipped fuel wood currently include reclaimed industrial wood residue and municipal wood residue processed at transfer stations and landfills. While Dane County encourages the use of wood residue for biofuel, this material is not recommended for use in home boilers because of their low temperatures and lack of pollution control equipment.

Mulch

To date, the production of mulch has been the most common approach to putting wood residue to use. Mulch is valuable for municipal landscaping and trail maintenance projects, agricultural ground cover, and homeowners' gardening needs. Several Dane County municipalities currently provide chipped wood to their residents for use as mulch. The City of Madison runs a large chipping operation that processes over 60,000 tons of wood on an annual basis. This mulch is available to Madison residents free of charge. Many Dane County municipalities also participate in a privately-owned and operated composting program to dispose of their yard waste and wood residue.

More detailed discussions of wood utilization possibilities can be found at the following locations:

- Utilizing Municipal Trees: Ideas from Across the County;
<http://www.na.fs.fed.us/spfo/pubs/misc/umt/>

- Harvesting Urban Timber; <http://harvestingurbantimber.com/>
- The Ash Utilization Options Project of Southeastern Michigan; <http://www.semircd.org/ash/>.

Post EAB Reforestation Efforts

Because ash currently comprises between 1/3 and 1/5 of municipal street and park trees, significant replanting will be necessary in the wake of EAB infestation. Following the Dutch Elm Disease epidemics of the twentieth-century, municipalities often replanted in single species rows and stands. We have learned from this mistake; with the likelihood of future tree diseases and pests in mind, urban foresters now highly recommend planting **a diversity of tree species**: no more than 10% of any single species (e.g. Red Oak, Sugar Maple, American Elm) and no more than 20% of a genus (e.g. Oak, Maple, Elm) (Santamour 1990). Homeowners may also choose among various tree species to replace lost ash on their property.

Commonly available alternatives to ash include maples (various species and cultivars), ginkgo, horse chestnut, hornbeam, corktree (various species), Kentucky coffee tree, thornless honeylocust, oak (various species), linden (various species), elm (various Dutch Elm Disease resistant species and cultivars), and many others.



Figure 31: Red Maple (*Acer rubrum*) (Photo: The Dow Gardens Archive)



Figure 32: Ginkgo (*Ginkgo biloba*)
(Photo: Richard Webb)



Figure 33: Honey Locust (*Gleditsia triacantho*)
(Photo: Richard Old, XID Services)



Figure 34: Pin Oak (*Quercus palustris*) (Photo: Richard Webb)

Local nurseries and arborists can provide additional guidance and tree planting tips. Also see:

- Dane County Tree Board, tree planting, care, and resources for Dane County <http://www.treeboard.org>
- *Recommended Alternatives to Ash Trees for Michigan's Lower Peninsula* <http://www.emeraldashborer.info/files/e2925.pdf>
- *Alternative to Ash Trees: Commercially Available Species and Cultivars* <http://www.uwex.edu/ces/wihort/landscape/AshAlternatives.doc>
- Arbor Day Foundation, tree planting tips and resources <http://www.arborday.org/trees/index.cfm>

Next Steps

Given that one of the most significant elements of EAB preparation entails developing procedures for the efficient, cost-effective, and environmentally sound processing and utilization of increased volumes of wood residue, determining how EAB planning intersects with a more comprehensive examination of wood utilization has been one of the most exciting challenges of the planning process. In many ways, this plan has built the foundations for continued movement in this direction. The relationships established between Dane County and the University of Wisconsin, United States Forest Service Forest Products Laboratory, Dane County Tree Board, local sawmill operators, and local biofuel manufacturers over the course of the planning process will be critical to the long-term success of Dane County's Wood Utilization Program.

Dane County plans to continue researching and developing collaborative partnerships in this area. In the near future, Dane County hopes to pursue funding to establish an experimental Wood Utilization Yard to investigate multiple value-added utilization opportunities. As a part of this important next step, Dane County will:

- Identify centrally located Wood Utilization Yards capable of handling unforeseen volumes of wood residue that are unmanageable at the local level and/or span multiple municipalities.
- Develop a budget for these yards and their required equipment.
- Continue to develop protocols for the handling of wood residue materials based on the needs of buyers.
- Work with our partners to identify limitations and recommendations related to the use of wood residue as a biofuel.
- Explore the potential of public/private partnerships to facilitate Wood Utilization Yard sites and their management.
- Investigate the feasibility and economics of the wood utilization opportunities outlined in this plan.

Appendix A: References and Sources for Additional Information

Publications

Alternatives to Ash Trees: Commercially Available Species and Cultivars. By Dr. Laura Jull, UW–Madison. A descriptive list of trees suitable for urban planting. Gives physical characteristics, growth rate, and tolerance to environmental stress for each species. Especially valuable for city foresters/ public works employees.

Ash Tree Identification (*MSU Extension Bulletin E-2942*). Photos and descriptions of various ash species and other trees commonly confused with ash.

Dispersal of Emerald Ash Borer: A Case Study at Tipton, Michigan. 2003. McCullough, Deborah G.; Poland, Therese; Cappaert, David. *In* Mastro, Victor; Reardon, Richard. Emerald ash borer research and technology development meeting; September 30 - October 1, Port Huron, MI. FHTET 2004-03. Morgantown, WV: U.S. Forest Service, Forest Health Technology Enterprise Team: 6-7.

The Green Menace (*PUB-FR-348-2006*). An introductory EAB brochure with information on basic biology, symptoms and signs (with photos), and a list of related websites.

Frequently Asked Questions about the Emerald Ash Borer (*PUB- FR-344b- 2006*). A one-page, informative Q&A handout specifically geared toward landowners.

Emerald Ash Borer Field Guide. An 18-page Forest Service field guide describing EAB survey techniques. Includes information on other common ash pests. Essential for survey training.

Emerald Ash Borer Toolkit for Wisconsin Communities. February 2007. Developed by the Wisconsin Department of Natural Resources, Division of Urban Forest Program.

My Ash Tree is Dead... Now What Do I Do? (*MSU Extension Bulletin E-2940*). Four pages of information regarding tips on hiring an arborist to remove the tree/s and options for value added use of removed tree/s.

Native Borers and EAB Look-alikes (*MSU Extension Bulletin E-2939*). Photos and descriptions of common ash pests often confused with EAB.

Signs and Symptoms of the Emerald Ash Borer (*MSU Extension Bulletin E-2938*). Photos of EAB in different life stages and the many signs and symptoms showing evidence of infestations.

USDA Forest Service EAB Pest Alert (*PUB-FR-354-2006*). A one-page introductory handout with EAB biology, history, and photos of symptoms and signs. Also available in a Spanish language version.

Using Girdled Trap Trees Effectively for Emerald Ash Borer Detection, Delimitation and Survey. Michigan State University, Michigan Technological University, USDA Forest Service. A six-page guide with hints on selecting, girdling and debarking trap trees.

Wisconsin Emerald Ash Borer Response Plan. July 2008. Wisconsin DATCP, Wisconsin DNR, USDA Forest Service, USDA Animal Plant Health Inspection Service, University of Wisconsin.

Web Resources

1. <http://emeraldashborer.wi.gov/>
 - EAB internet portal for Wisconsin sponsored by Wisconsin Department of Agriculture, Trade and Consumer Protection, the Wisconsin Department of Natural Resources and the University of Wisconsin-Madison.
 - Contains information from a Wisconsin perspective on EAB biology, management, survey activities, publications, and provides related links.
2. <http://www.emeraldashborer.info/>
 - Official emerald ash borer webpage administered by Michigan State University.
 - Contains information on EAB biology, distribution, control measures, current research and links to various EAB infested states' websites.
3. <http://www.dnr.state.wi.us/org/land/Forestry/FH/Ash/index.htm>
 - Wisconsin DNR EAB Website.
 - Contains information on Wisconsin's ash resource, EAB biology, signs and symptoms, risk maps, survey plans, how to report EAB and other ash pests.
4. <http://www.datcp.state.wi.us/arm/environment/insects/emerald-ash-borer/index.jsp>
 - Wisconsin Department of Agriculture, Trade and Consumer Protection's EAB Website. Contains the *Wisconsin Emerald Ash Borer Response Plan*, PowerPoint presentations, Wisconsin's EAB survey program and other general information.
5. <http://www.entomology.wisc.edu/emeraldashborer/>
 - UW-Extension, Dept. of Entomology's EAB Website.
 - Contains information regarding EAB biology, signs and symptoms, images of EAB look-alikes.

6. <http://www.ncrs.fs.fed.us/4501/eab/maps/>
 - USDA Forest Service North Central Research Station Website
 - Contains information and maps on known EAB infestations as well as information on EAB biology.
7. <http://www.semircd.org/ash/>
 - Ash Utilization Options Project of Southeastern Michigan website. Contains information on positive uses of EAB infested wood, demonstration projects, and research on ash utilization.
8. <http://www.forestryimages.org/>
 - Images of trees, forest pests, and forestry activities.

Appendix B: Glossary

DATCP - The Wisconsin Department of Agriculture Trade and Consumer Protection. DATCP is the regulatory authority and the lead agency for Wisconsin's EAB response activities.

DBH - diameter at breast height; represents the diameter in inches of a trunk cross-section measured at 4½ feet above ground level; a basis for estimating or identifying tree volume, value, management needs and costs, and utilization options.

DNR - The Wisconsin Department of Natural Resources, a partner agency in Wisconsin's EAB response activities.

Delimit - to establish geographic limits or boundaries; emerald ash borer quarantine areas are determined after *delimiting* or determining the extent of area infested by EAB.

EAB - the emerald ash borer insect; as an adult it measures approximately 1/2" in length by 1/8" wide, is metallic green in color and often described as "bullet shaped." EAB larvae can reach a length of a little more than 1" in length, are white to cream colored, and have a ten segmented abdomen with a pair of brown, pincher-like appendages on the last segment.

EAB readiness team - the group of people responsible for all aspects of preparing for emerald ash borer's arrival in a particular jurisdiction/municipality.

EAB readiness plan - a document delineating local EAB readiness activities and processes; includes scope & purpose, authority, responsibility, policies & procedures, actions/tasks, available resources, forms & contracts, technical references & support information, and other relevant content.

Infestation - an area where the ash trees have been positively identified as having a sustained population of EAB.

Wood Utilization Yard - a location within a quarantined area where infested or quarantined trees are collected and held for further handling.

Phloem - The living tissue found directly beneath a tree's bark that transports nutrients within the tree. EAB larvae feed on ash phloem, thus impairing the trees circulatory activities and eventually resulting in the tree's death. For more information on tree anatomy, see <http://www.arborday.org/trees/treeGuide/anatomy.cfm>.

Quarantine Area - a defined geographic area from which goods may not be transported; quarantines will be established by federal or state agencies to restrict ash wood movement out of infested areas to avoid emerald ash borer infestation of new areas; quarantines can be applied to an individual property, township, county or entire state.

Appendix C: Federal and State Regulations Providing Authority to Control EAB

Federal Laws and Regulations

- **Plant Pest Act 2000 – Prevent spread of plant pests**
<http://www.aphis.usda.gov/ppq/weeds/PPAText.PDF>
- **7CFR 301.53 – 301.53-9 - EAB regulations**
http://www.access.gpo.gov/nara/cfr/waisidx_05/7cfr301_05.html
- **7CFR 319.40 - Solid wood packing material.**
http://www.access.gpo.gov/nara/cfr/waisidx_01/7cfr319_01.html

Wisconsin State Statutes Providing State Authority

Note: Unless otherwise noted, “the department” refers here to the Wisconsin Department of Natural Resources.

- **26.30 - Forest insects and diseases, department jurisdiction and procedure.**
<http://www.legis.state.wi.us/statutes/Stat0026.pdf>

(1) **PURPOSE.** It is the public policy of the state to control forest pests on or threatening forests of the state in order to protect the forest resources, promote good forest management, enhance the growth and maintenance of forests, promote stability of forest-using industries, aid in fire control by reducing the menace created by dying and dead trees, conserve forest cover on watersheds and protect wildlife, recreational values and other values of the forest.

(2) **POWERS.** The department is vested with authority and jurisdiction in all matters relating to the prevention, detection and control of forest pests on the forest lands of the state, and to do all things necessary in the exercise of such authority and jurisdiction, except that this shall not be construed to grant any

powers or authority to the department for the silvicultural control of forest pests on any land. This section shall apply only to the detection and control of forest pests on forest lands and does not affect the authority of the department of agriculture, trade and consumer protection under chs. 93 and 94. The action of the department under sub. (4) shall be coordinated with the department of agriculture, trade and consumer protection in accordance with s. 20.901. The secretaries of natural resources and agriculture, trade and consumer protection shall execute annually a memorandum of agreement to enable the coordination of pest control work of their departments.

- **94.01 - Plant inspection and pest control authority.**

<http://www.legis.state.wi.us/statutes/Stat0094.pdf>

(1) In the conduct of survey and inspectional programs for the detection, prevention and control of pests, the department may impose quarantines or such other restrictions on the importation into or movement of plants or other material within this state as necessary to prevent or control the dissemination or spread of injurious pests.

(2) In accordance with [sub. \(1\)](#), the department, by summary order, may prohibit the removal of any plant, host plant, or other pest-harboring material from any private or public property, or any area of the state which in its judgment contains or is exposed to injurious pests, except under such conditions as in its judgment are necessary to prevent the dissemination or spread of pests, giving written notice thereof to the owner or person in charge of the property. While such order is in effect no person with knowledge thereof shall cause or permit the removal of any such plant, host plant or other pest-harboring material from such property or area, unless it is in compliance with the conditions of such order. Orders issued under this subsection shall be in writing, have the force and effect of an order issued under [s. 93.18](#), and are subject to right of hearing before the department, if requested within 10 days after date of service. Any party affected by the order may request a preliminary or informal hearing pending the scheduling and conduct of a full hearing.

(3) No person may obstruct or interfere with the examination or testing, by authorized inspectors and agents of the department, of any plants or other material suspected of being infested or infected with any injurious pests; nor may any person move any plants, plant parts, pests or pest-harboring materials contrary to the terms of any quarantine, rule, notice or order under this section.

(4) The department, through its authorized agents or inspectors, may enter at all reasonable times any property for purposes of inspection, investigation and control of suspected pest infestations or infections and may intercept, stop and detain for official inspection any person, truck, vessel, aircraft or other conveyance believed to be carrying plants or other materials infested or infected with pests, and may seize and destroy any such plants or other materials moved, shipped or transported in violation of any law, rule, quarantine notice or order.

- **94.02 - Abatement of pests.**

(1) If the department finds any premises, or any plants, plant parts, or pest-harboring materials located thereon are so infested or infected with injurious pests as to constitute a hazard to plant or animal life in the state, or any area thereof, it may notify the owner or person having charge of such premises to that effect, and the owner or person in charge shall, within 10 days after such notice, cause the treatment of the premises or the treatment or removal and destruction of infested or infected plants, host plants or other pest-harboring material as directed in the notice. No person may violate the terms of any notice received under this subsection, nor may any damages be awarded to the owner for such treatment, removal or destruction. Any person affected by a notice or order may appeal to the department and request a hearing under [s. 94.01 \(2\)](#).

(2) If the owner or person in charge fails to comply with the terms of the notice, within 10 days after receiving it, the department or any cooperating local unit of government may proceed to treat the premises or to treat or destroy the infested or infected plants or other material. The expense of such abatement shall be certified to the town, city or village clerk and assessed, collected and enforced against the premises upon which such expense was incurred as taxes are assessed, collected, and enforced, and shall be paid to the cooperating unit of government incurring the expense, or into the general fund if the control work was conducted by the department.

(3) If a serious pest outbreak constituting a significant threat to agricultural production or plant life occurs, and cannot be adequately controlled by individual property owners or local units of government in any area of this state, the department may petition the joint committee on finance for emergency funds with which to conduct needed control work independently or on a cooperative basis with the federal or local units of government.

(4) This section pertains to the abatement of pests on agricultural lands and on agricultural business premises. This section does not affect the authority of the department of natural resources under [ch. 26](#).

- **94.03 - Shipment of pests and biological control agents permits.**

1) No person may sell or offer for sale, or move, transport, deliver, ship or offer for shipment, any pest, as defined in [s. 93.01 \(10\)](#) or any biological control agent as defined in [sub. \(2\)](#), without a permit as prescribed by rules of the department. Such rules may provide for reasonable exemptions from permit requirements. Permits may be issued only after the department determines that the proposed shipment or use will not create sufficient hazard to warrant refusal of a permit. Permits shall be affixed to the outside of every shipping container or accompany the shipment as the department directs.

(2) The department may by rule regulate and control the sale and use of biological control agents to assure their safety and effectiveness in the control of injurious pests and to prevent the introduction or use of biological control agents which may be injurious to persons or property or useful plant or animal life. The term "biological control agent" as used in this section means any living organism which because of its parasitic, predatory or other biological characteristics may be

effective for use in the suppression or control of pests by biological rather than chemical means.

- **94.10 - Nursery stock, inspection and licensing** (*only relevant sections included here*)

(2)Nursery dealer; annual license.

(a) *License required.* Except as provided in [par. \(f\)](#), no person may operate as a nursery dealer without an annual license from the department. A nursery dealer license expires on February 20. A nursery dealer license may not be transferred to another person.

(3)Nursery grower; annual license.

(a) *License required.* Except as provided in [par. \(f\)](#), no person may operate as a nursery grower without an annual license from the department. A nursery grower license expires on February 20. A nursery grower license may not be transferred to another person.

(3g)Christmas tree grower; annual license.

(a) *License required.* Except as provided in [par. \(e\)](#), no person may operate as a Christmas tree grower without an annual license from the department. A Christmas tree grower license expires on February 20. A Christmas tree grower license may not be transferred to another person.

(4)Nursery growers and dealers; records.

(a) *Nursery dealers; records of nursery stock received.* A nursery dealer shall keep a record of every shipment of nursery stock received by the nursery dealer. The nursery dealer shall include all of the following in the record:

1. A description of the types of nursery stock, and the quantity of nursery stock of each type, included in the shipment.
2. The name and address of the source from which the nursery dealer received the shipment.

(b) *Nursery growers and dealers; records of shipments to other nursery growers and dealers.* Each nursery grower and nursery dealer shall record every shipment of nursery stock that the nursery grower or nursery dealer sells or distributes to another nursery grower or nursery dealer. The nursery grower or nursery dealer shall include all of the following in the record:

1. A description of the types of nursery stock, and the quantity of nursery stock of each type, included in the shipment.
2. The name and address of the nursery grower or nursery dealer receiving the shipment.

(c) *Records retained and made available.* A nursery grower or nursery dealer who is required to keep records under [par. \(a\)](#) or [\(b\)](#) shall retain those records for at least 3 years and shall make those records available to the department for inspection and copying upon request.

(5)Labeling nursery stock.

(a) *Nursery stock shipped to grower or dealer.* No person may sell or distribute any shipment of nursery stock to a nursery grower or nursery dealer, and no nursery grower or nursery dealer may accept a shipment of nursery stock, unless that shipment is labeled with all of the following:

1. The name and address of the person selling or distributing the shipment to the nursery grower or nursery dealer.

2. A certification, by the person under [subd. 1.](#), that all of the nursery stock included in the shipment is from officially inspected sources.

(b) *Growers and dealers to report unlabeled shipments.* Whenever any person tenders to a nursery grower or nursery dealer any shipment of nursery stock that is not fully labeled according to [par. \(a\)](#), the nursery grower or nursery dealer shall promptly report that unlabeled shipment to the department.

(c) *Nursery stock sold at retail.* A person selling nursery stock at retail shall ensure that the nursery stock is labeled with the common or botanical name of the nursery stock.

(6) Care of nursery stock.

(a) *Adequate facilities.* A nursery grower or nursery dealer shall maintain facilities that are reasonably adequate for the care and keeping of nursery stock held for sale, so that the nursery grower or nursery dealer can keep the nursery stock in healthy condition pending sale.

(b) *Reasonable examinations.* Nursery growers and nursery dealers shall make reasonable examinations of nursery stock held for sale to determine whether that nursery stock is capable of reasonable growth, is infested with injurious pests or is infected with disease.

(7) Prohibitions.

(a) *Nursery dealers.* No nursery dealer may do any of the following:

1. Obtain, hold, sell, offer to sell or distribute nursery stock from any source other than an officially inspected source.

2. Misrepresent that the nursery dealer is a nursery grower.

(b) *Nursery growers and dealers.* No nursery grower or nursery dealer may do any of the following:

1. Sell, offer to sell or distribute any nursery stock that the nursery grower or nursery dealer knows, or has reason to know, is infested with plant pests or infected with plant diseases that may be spread by the sale or distribution of that nursery stock.

2. Sell, offer to sell or distribute any nursery stock that the nursery grower or nursery dealer knows, or has reason to know, will not survive or grow.

3. Misrepresent the name, origin, grade, variety, quality or hardiness of any nursery stock offered for sale or make any other false or misleading representation in the advertising or sale of nursery stock.

4. Conceal nursery stock to avoid inspection by the department, falsify any record required under this section or make any false or misleading statement to the department.

(8) Department inspection. The department may inspect nurseries and premises at which nursery stock is held for sale or distribution. The department may inspect premises at which evergreen trees are grown for eventual sale as Christmas trees and premises at which Christmas trees are held for sale or distribution.

(9) Department orders.

(a) *Holding orders and remedial orders.* An authorized employee or agent of the department may, by written notice, order a nursery grower or nursery dealer to do any of the following:

1. Temporarily hold nursery stock pending inspection by the department.
2. Remedy violations of this section.
3. Refrain from importing weeds or pests that threaten agricultural production or the environment in this state.
4. Permanently withhold nursery stock from sale or distribution, if the sale or distribution would violate this section or an order issued under this section and the violation cannot be adequately remedied in another manner.
5. Destroy or return, without compensation from the department, nursery stock that is sold or distributed in violation of this section, or an order issued under this section, if the violation cannot be adequately remedied in another manner.

(10) Reciprocal agreements with other states.

(a) *General.* The department may enter into reciprocal agreements with other states to facilitate interstate shipments of nursery stock.

(b) *Officially inspected sources.* As part of an agreement under [par. \(a\)](#), the department may recognize sources of nursery stock in another state as officially inspected sources.

(c) *Inspection and certification standards.* An agreement under [par. \(a\)](#) may specify standards and procedures for all of the following:

1. Inspecting officially inspected sources of nursery stock.
2. Inspecting and certifying interstate shipments of nursery stock.

- **94.46 - Stop sale, penalties, enforcement.**

(1) The department may issue a written or printed "stop sale" order to the owner or custodian of any lot of agricultural or vegetable seed not conforming with [ss. 94.38 to 94.46](#), or rules thereunder. The order shall specify the sections of the law or rules violated and shall prohibit the sale or other disposition of the seed except as the department authorizes or directs. Unless the seed is brought into compliance with the law or rules and is released from the "stop sale" order, or other disposition is agreed upon in writing within 30 days after service of the order, the seed shall be disposed of as the department by notice in writing may direct. This shall not preclude the voluntary signing of a disposal agreement without the issuance of a "stop sale" order. Any notice or order hereunder may be served personally or by mail and shall have the effect of a special order under [s. 93.18](#) subject to review under [ch. 227](#) if within 10 days after service of any notice or order, the owner or custodian files with the department a written request for a hearing. Final disposition of the seed shall be stayed during pendency of the hearing but the "stop sale" order shall remain in effect.

(2) Any lot of agricultural or vegetable seed not in compliance with [ss. 94.38 to 94.46](#), or rules thereunder, or not disposed of in accordance with any disposal agreement or order under [sub. \(1\)](#), shall be subject to seizure on complaint of the department to a court of competent jurisdiction. If the court finds the seed to be in

violation of law and orders the condemnation of said seed, it shall be denatured, processed, destroyed, relabeled or otherwise disposed of as the court directs.

(3) In addition to or in lieu of other remedies provided for enforcement of [ss. 94.38 to 94.46](#), the department may apply to the circuit court for a temporary or permanent injunction to prevent, restrain, or enjoin any person from violating [ss. 94.38 to 94.46](#) or any rules or orders issued thereunder.

(4) (a) Any person violating [ss. 94.38 to 94.46](#) or rules promulgated thereunder shall forfeit not less than \$100 nor more than \$500 for the first offense. For any subsequent offense occurring within 5 years of a previous offense, the person shall forfeit, for each offense, not less than \$200 nor more than \$1,000. The 5-year period shall be measured from the dates of the violations which resulted in convictions.

(b) Any person who knowingly violates [ss. 94.38 to 94.46](#) or rules promulgated thereunder may be fined not more than \$500 or imprisoned not more than 6 months or both.

Wisconsin Administrative Rules Providing State Authority

- **ATCP 21.17 - Emerald ash borer; import controls and quarantine**
 - (1) Importing or Moving Regulated Items From Infested Areas; Prohibition. Except as provided in sub. (3), no person may do any of the following:
 - (a) Import a regulated item under sub. (2) into this state if that item originates from an emerald ash borer regulated area identified in 7 CFR 301.53-3.
 - (b) Move any regulated item under sub. (2) out of an emerald ash borer regulated area that is identified in 7 CFR 301.53-3 and located in this state.
 - (2) Regulated Items. The following are regulated items for purposes of sub. (1):
 - (a) The emerald ash borer, *Agrilus planipennis* Fairmaire, in any living stage.
 - (b) Ash trees.
 - (c) Ash limbs, branches and roots.
 - (d) Ash logs, slabs or untreated lumber with bark attached.
 - (e) Cut firewood of all non-coniferous species.
 - (f) Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter.
 - (g) Any other item or substance not listed in sub. (2) that may be designated as a regulated item if a pest control official determines that it presents a risk of spreading emerald ash borer and notifies the person in possession of the item or substance that it is subject to the restrictions of the regulations.
 - (3) Inspected and Certified Items; Exemption. Subsection (1) does not prohibit the shipment of a regulated item if a pest control official in the state or province of origin does all of the following:
 - (a) Inspects the regulated item.
 - (b) Certifies any of the following in a certificate that accompanies the shipment:
 1. The regulated item originates from non-infested premises and has not been exposed to emerald ash borer.

2. The regulated item was found, at the time of inspection, to be free of emerald ash borer.
 3. The regulated item has been effectively treated to destroy emerald ash borer. The certificate shall specify the date and method of treatment.
 4. The regulated item is produced, processed, stored, handled or used under conditions, described in the certificate, that effectively preclude the transmission of emerald ash borer.
- History: CR 06–008: cr. Register October 2006 No. 610, eff. 11–1–06.

- **NR 45.04(1)(g) – Firewood – restrictions on state property**
No person may possess firewood that originates from greater than 50 miles from the campground on that property where the wood will be used, or the property itself if there is no campground, or from outside the borders of the state. Firewood from sources approved by the department of agriculture, trade and consumer protection is allowable. Firewood includes all wood, processed or unprocessed, intended for use in a campfire. The department may seize and dispose of firewood possessed in violation of this paragraph.
Note: A list of firewood sources approved by the department of agriculture, trade and consumer protection can be obtained by contacting Robert Dahl, WI DATCP, PO Box 8911, Madison, WI 53708, 608–224–4573, robert.dahl@datcp.state.wi.us.

Wisconsin State Statutes Providing Local Government Authority

- **27.09 City forester, duties; tree planting.**
<http://www.legis.state.wi.us/statutes/Stat0027.pdf>
 - (1) The board of park commissioners of every city may employ a city forester to take charge of and direct, subject to its supervision and control, all of the work authorized to be done under this section. It may also designate a municipal employee to perform the duties of city forester.
 - (2) The common council shall include in its annual budget such sum as it deems necessary, if any, to meet all expenses of doing said work during the following fiscal year, including the salary of the city forester and the compensation of employees assisting the city forester, but not including amounts assessable to abutting property; and the taxes levied to provide for such expense shall be in addition to all other taxes for park and boulevard purposes.
 - (3) The board may plant, transplant, remove, trim, spray and otherwise care for and protect all trees and shrubs on or in that part of every street, the grade of which has been established, lying between the lot line and the curb, or in the center or side plots in all boulevards and parkways, and in all public parks or grounds belonging to the city and control all such planting and transplanting by others. The board may guard all trees within the city so as to prevent the spread of disease or pests and to eliminate dangerous conditions, and may proceed pursuant to subs. (4) to (7).

(4) Whenever the board proposes the setting out, planting or removing of any such living shade tree, it shall give 2 weeks' written notice to the owner of the lot or parcel of land on which such tree stands or will stand, or the owner's agent, or, if neither is known and there be a tenant occupying said property, then to such tenant, of a time and place at which said contemplated work will be considered by the city forester, specifying in detail the street, avenue or boulevard and portion thereof, upon or from which trees are proposed to be planted or removed, and the general nature and character of the changes and improvements contemplated. After such hearing, the city forester, subject to the direction of the board shall abandon said work or proceed with it as the city forester believes the best interest of the public requires.

(5) The entire or any part of the cost of protecting, trimming, spraying, planting, renewing and removal of trees and shrubs between the lot line and the curb in front of any lot or parcel of land abutting on a street, avenue or boulevard may be chargeable to and assessed upon such lot or parcels of land. The governing body shall hold a public hearing on the proposed assessment, and shall give notice thereof in such city or village, by publishing a class 2 notice, under ch. 985.

(6) The board shall keep a strict account of the cost of planting, protecting, renewing, removing, trimming, spraying and caring for trees and shrubs in front of each lot or parcel of land abutting on any street, avenue, or boulevard, and prior to November 10 in each year, shall make a report to the comptroller in cities having such an officer, and in other cities to the common council, of all work done for which assessments have been made as hereinbefore provided stating and certifying the description of land, lots, parts of lots or parcels of land abutting on a street, avenue or boulevard in which any such work shall have been done, and the amount chargeable to each such piece of property; and the comptroller at the time of making the comptroller's annual report to the common council of the lots or parcels of land subject to special assessments shall include therein the lots or parcels of land so reported to the comptroller by the board of park commissioners with the amount chargeable thereto for work done during the preceding year.

(7) The amounts so reported directly or through a comptroller to the council shall be levied on said lots or parcels of land, respectively, to which they are chargeable and shall constitute a lien thereon and shall be collected as other special taxes are levied and collected in the city. The board shall advance out of the park or other proper fund sufficient money for doing said work and said special assessments shall be credited to said fund of said city and shall not be diverted or used for any other purpose.

- **27.13 Town and village parks.**

Every town and village may provide and maintain parks, parkways, boulevards or pleasure drives pursuant to the provisions of this chapter which are applicable to cities.

- **823.01 Jurisdiction over nuisances.**

<http://www.legis.state.wi.us/statutes/Stat0823.pdf>

Any person, county, city, village or town may maintain an action to recover damages or to abate a public nuisance from which injuries peculiar to the complainant are suffered, so far as necessary to protect the complainant's rights and to obtain an injunction to prevent the same.

Appendix D: Local Ordinance Provisions & Policies for EAB

Local ordinances and policies can help prevent or control damage resulting from EAB infestation. Ordinances and policies should be based on local circumstances, management needs, goals, and capacity. Ordinance provisions and policies that work well in one municipality might be poorly suited for another.

Prevention and Risk Management

Marinette County Firewood Ordinance 16.09(1)(o)

No person may possess firewood that originates from outside the borders of Marinette County in any Marinette County campgrounds or on Marinette County park or forest property. Firewood includes all wood, processed or unprocessed, intended for use in a campfire. Department staff may seize and dispose of firewood possessed in violation of this ordinance.

Whether or not a community chooses to adopt ordinance provisions or establish formal policies about firewood movement or storage, “Local Actions to Avoid EAB Introduction via Firewood” (section 7.b.2 of the *EAB Toolkit for Wisconsin Communities*) gives suggestions for reducing the chance that EAB—or any other non-indigenous pest—is introduced to a community through firewood.

Control

The following examples of tree ordinance provisions may provide local authority for EAB management.

Authority of the Municipality

...The City/Village shall have the authority and jurisdiction to plant, prune, maintain, and remove trees within the rights-of-way of all streets, alleys, avenues, lanes and public properties and parks and tree-planting easements as may be necessary to insure public safety or to preserve or enhance the symmetry and beauty of such public property.

The City/Village shall have the right to treat or cause the treatment of any diseased or infested trees on private property when such trees constitute a potential hazard to the urban forest.

The City/Village shall have the right to remove or cause the removal of any dead, diseased, infested, or structurally damaged tree, or portion of tree, on private property when such tree constitutes a potential hazard to life and property within the right-of-way or on public property or constitutes a threat to the urban forest...

Authority of the Forester

...The City/Village Forester shall have the authority and jurisdiction of regulating the planting, maintenance, and removal of trees on public property and, subject to private property tree and vegetation regulations, to insure safety or preserve the aesthetics of such public sites.

The City/Village Forester may inspect any trees, shrubs, vines, hedges, plants, logs or branches existing or growing upon any property within the City/Village. The City/Village Forester may conduct surveys to determine if any destructive or communicable disease or other pest exists which may be detrimental to or endanger the good health and well being of trees or other plant life in the City/Village.

The City/Village Forester shall have the authority and jurisdiction to restrict tree maintenance activities within the City/Village limits to reduce the spread of infectious diseases and/or insects. Restrictions are to be listed in the Forestry Program Manual and presented annually in the local media.

The City/Village Forester shall enforce such rules, regulations, permit, and penalty procedures as deemed necessary and may do so by the issuance of municipal citations to effectuate the intent of this chapter. No person shall unreasonably hinder, prevent, delay, or interfere with the City/Village Forester or his/her agents while engaged in the execution of this ordinance...

Public Nuisance

Local governments should expect to manage EAB with their own resources (funds and personnel), therefore municipalities are encouraged to adopt ordinance language allowing emerald ash borer to be declared a public nuisance and authorizing control on both public and private property. Some communities already have authority to inspect and condemn privately owned trees via existing Dutch elm disease, general tree or nuisance tree ordinances. The following samples of nuisance declaration language may be useful.

Declaration of Nuisance

An ordinance provision declaring certain trees to be a public nuisance might read as follows:

...The (city forester/village forester/public works director/safety director) or his/her designee shall have the right to declare as a public nuisance any tree or shrub or part thereof, including firewood, existing anywhere in the city which is:

(1) Interfering with the use of any public area,

- (2) *Infected with a plant disease,*
- (3) *Infested with insects, or*
- (4) *Endangering the life, health or safety of other trees/shrubs, persons or property...*

Abatement of Nuisance

An ordinance provision requiring tree nuisance abatement might read as follows:

... No person shall permit any public nuisance as defined in subsection (___) of this section to remain on any premises owned or controlled by him within the City/Village. Upon determination by the (city forester/village forester/public works director/safety director) or his/her designee that any nuisance tree or shrub, as herein defined, exists in or upon any private premises, he/she shall give written notice to the owner or tenant having charge of such premises to treat, remove or otherwise control such tree in such manner as will abate such nuisance. Within (fifteen/thirty) days after the issuance of such notice, the person shall cause treatment, removal or control of the nuisance tree as directed in the written notice. Should the owner or tenant neglect to comply with the terms of the written notice within (fifteen/thirty) days after receiving it, the (city forester/village forester/public works director/safety director) or his/her designee shall cause the treatment, removal or other control of the nuisance tree. The expense thereof shall be assessed as a lien against the property for collection as other taxes...

Treatment of Public Trees

An ordinance provision authorizing treatment or removal of infested public trees might read as follows:

...All trees, shrubs or parts thereof on public property shall be subject to treatment and/or removal when it is determined by the (city forester/village forester/public works director/public safety director) or his/her designee that the trees or shrubs constitute an immediate or future health or safety hazard or when they have become unsightly, infested, diseased or dead. The (city forester/village forester/public works director/public safety director) or his/her designee shall have the discretion to determine the most appropriate course of action to prevent or treat such conditions....

General Tree Provisions

Beyond language to address EAB and similar public nuisances, ordinances should include provisions for general planting, care and management of the entire municipal tree population. An example of such an ordinance from the city of Stevens Point follows this section. An excellent how-to publication called “Guidelines for Developing and Evaluating Municipal Tree Ordinances” is

available at the International Society of Arboriculture Web site, www.isa-arbor.com/publications/ordinance.aspx.

Note: Municipal codes for many Wisconsin communities are available on-line and can be accessed at the municipality's Web site or via one of the following on-line code publishers:

Municipal Code Corporation –

www.municode.com/resources/code_list.asp?stateID=49

General Code Publishers – www.generalcode.com/webcode2.html

LexisNexis Municipal Codes – <http://municipalcodes.lexisnexis.com/#WI>

Note: Sample ordinance language contained in this section is not meant to bypass a goals-based process for ordinance development or to replace guidance from local officials, staff, legal counsel, etc.

Appendix E: Certified Arborists Serving Dane County

Bassett, Steven R.

Steven R. Bassett, Inc.
547 Chatham Terrace
Madison, WI 53711
(608) 233-6152
Website:

www.stevenrbassettinc.com

Boley, Rodney

Boley Tree and Landscape Care,
Inc.
2305 Parkview Rd. Suite 150
Middleton, WI 53562
(608) 831-5638
Website:

www.boleytrecare.com

Dorshak, Jesse

Dorshak Tree Specialist Inc
5140 N. 126th St.
Butler, WI 53007
(262) 783-8733

Website: www.Dorshaktree.com

E-Mail: Jesse@Dorshaktree.com

Gall, John

Wachtel Tree Science & Service
Inc
P.O. Box 716
Merton, WI 53056
(262) 538-1900

Website: www.healthytrees.com

E-Mail: JGall@wachteltree.com

Gere, Sean

Gere Tree Care, Inc.
460 W. James St.
Columbus, WI 53925
(608) 225-9118

Website: geretreecare.com

E-Mail: sean@geretreecare.com

Haessig, Bill C.

H&H Arborist Inc.
1717 Autumn Hill Dr.
Verona, WI 53593
(608) 274-7001

Kaseman-Wold, Peter

Goodland Tree Works, Inc.
4404 Goodland Park Rd.
Madison, WI 53711
(608) 221-9565
Website:

www.goodlandtreeworks.com

Lancaster, Greg

Lancaster & Associates, Inc.
N8220 Smith Rd.
Brooklyn, WI 53521
(608) 455-2077
E-Mail: glancast@chorus.net

Lapp, James A.

Jim's Tree Service Inc.
2757 Door Creek Rd.
Stoughton, WI 53589
(608) 222-9504
Website:

www.jimstreeserviceinc.com

E-Mail: jts2757@aol.com

Markworth, Paul

Wachtel Tree Science & Service,
Inc.
P.O. Box 716
Merton, WI 53056
(262) 538-1900

Website: www.healthytrees.com

E-Mail:

pmarkworth@wachteltree.com

Nelson, D. Logan

Blue Sky Tree Care LLC
1029 County Road A
Edgerton, WI 53534
(608) 884-4775
E-Mail: treegoowoo@jvl.net

Nelson, Randy

Blue Sky Tree Care LLC
1029 County Road A
Edgerton, WI 53534
(608) 884-4775
E-Mail: arbormon@earthlink.net

Olson, Jeff

Arborsystems
5637 Montadale
Madison, WI 53711
(608) 274-7879

Samuelsen, Don

Samuelsen Consulting & Agape Tree
Care
N4383 Jacobson Drive
Rio, WI 53960
(608) 770-1487
Website: www.treetrimming.org
E-Mail: Samuelsen7@centurytel.net

Tangeman, Dean

Osage Arbor Care LLC.
100 S. Prairie St.
Stoughton, WI 53589
(608) 877-0944

Vicen, Steven E.

Steven R. Bassett Inc.
2993 Kapec Rd.
Madison, WI 53719
(608) 233-6152
Website:
www.stevenbassettinc.com

Whitney, Butch

Whitney Tree Service LLC
N3137 Aebly Road
Monroe, WI 53566
(608)-329-5380

Appendix F: South-Central Wisconsin Hardwood Processors

*Firms specifying ash as a species processed in the DNR's *Wisconsin Primary Wood Using Industry Directory* are starred.

Aspenson Lumber Company

Paul Aspenson
21698 STH 60
Muscodia, WI 53573
(608) 739-4315

***Ballweg Custom Sawing, Inc.**

Jerome Ballweg
6556 CTR KP
Mazomanie, WI 53560
(608) 643-8045

***City Wood Treecycling, LLC**

Dave Arnold
4520 Oak Springs Circle
Deforest, WI 53532
(608) 698-7559
darnold@citywoodtreecycling.com

Deppler Wood Shop

Steve Fraiser
N2893 Youth Cabin Rd
Monroe, WI 53566-9189
(608) 325-3329

Fischer Brothers

Laverne Fischer
Jefferson, WI 53549
(920) 593-2321

***Forest Hack-Away Products**

Mike Wilm
S3863 US HWY 12
Baraboo, WI 53913-9382
(608) 356-8215

***Forest Pearson Products, Inc.**

John Pearson
E3906 Cemetery Rd
Reedsburg, WI 53959-7638
(608) 985-7638

Hardwood Hills Sawmill

Paul F Klassy Jr.
W6701 Klassy Rd
New Glarus, WI 53574-9734
608-527-5394

***Hanson & Leja Lumber Company**

John Hanson
N2197 STH 26
Watertown, WI 53098-3833
(920) 261-1831

Lawrence J Batz Sawmill

5469 Midland Rd
Mazomanie, WI 53560
(608) 767-3615

***Meister Log & Lumber Company**

Tony Jablonski, manager
1440 Laukant St
PO Box 308
Reedsburg, WI 53959
(608) 524-4412

***Nelson Hardwood Lumber Company**

Gary Nelson
1460 E Nelson Ave
Muscodia, WI 53573
(608) 739-343

Norske Wood Works

Harold Norslien
4738 HWY 78
Black Earth, WI 53515
(608) 767-3994

Paschke, Robin

9900 S. CTH H
Beloit, WI 53511-53511
(608) 362-8549

Peterson, Morrie
7839 E. CTH A
Janesville, WI 53546
(608) 754-9229

***Ray Zobel & Son, Inc.**
Jane Muchow
321 Warehouse Rd
Reedsburg, WI 53959
(608) 524-2194

***Rock Valley Lumber Mill, Inc.**
Evan Sayre
8203 County Road H
Edgerton, WI 53534
(608) 884-4574

Ruhland Harland Sawmills
E5597 Mound Rd.
Loganville, WI 5394
608-546-4884

Smith's Portable Sawmill
Nelson Smith
1218 Elida Street
Janesville, WI 53545
(608) 754-9555

Stackman's Sawmill
Arlin Stackman
E8785 STH 136
Rock Springs, WI 53961
608-522-4954

***Sugar River Hardwoods**
Greg Roth
N6768 County Hwy X
Albany, WI 53502
(608) 516-9578

Appendix G: Chipper and Grinder Manufacturers

Bandit Industries, Inc.

6750 W. Millbrook Rd.
Remus, MI 49340
(800) 952-0178
Fax: (989) 561-2273
www.banditchippers.com
(whole wood chippers)

CW Mill Equipment

14 Commerce Dr.
Sebatha, KS 66534
(785) 284-3454
Fax: (785) 284-3601
www.hogzilla.com
(grinder)

CBI

22 Whittier St.
Newton, NH 03858
(603) 382-0556
Fax: (603) 382-0557
www.cbi-inc.com
(hog)

Diamond Z Manufacturing

11299 Bass Lane
Caldwell, ID 83605
(800) 949-2383
Fax: (208) 585-2112
www.diamondz.com
(grinder)

DuraTech Industries

P.O. Box 1940
Jamestown, ND 58402
(701) 252-4601
Fax: (701) 252-0502
www.duratechindustries.net
(tub grinder)

Dynamic Manufacturing Corp.

P.O. Box 39
Weidmann, MI 48893
(989) 644-8109
Fax: (989) 644-6697
www.dynamicmfgcorp.com
(chipper)

Morbark, Inc.

P.O. Box 100
Winn, MI 48896
(800) 233-6065
Fax: (989) 866-2280
www.morbark.com
(chipper)

Peterson Corp.

P.O. Box 40490
Eugene, OR 97404
(800) 269-6520
Fax: (541) 689-0804
www.petersonpacific.com
(rack grinder)

Precision Husky Corp.

P.O. Box 507
Leeds, AL 35094
(205) 640-5181
Fax: (205) 640-1147
www.precisionhusky.com
(grinder to chipper)

Rotochopper

217 West St.
St. Martin, MN 56376
(320) 548-3586
Fax: (320) 548-3372
www.rotochopper.com
(grinder)

Trelan Manufacturing Corp.

498 8 Mile Rd.

Remus, MI 49340

(989) 561-2280

Fax: (989) 561-2530

www.trelan.com

(whole tree chipper)

Vermeer Manufacturing Co.

P.O. Box 200

Pella, IA 50219

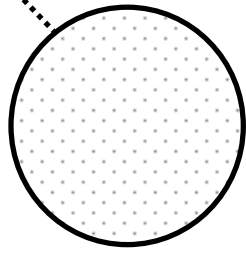
(641) 628-3141

Fax: (641) 621-7734

www.vermeermfg.com

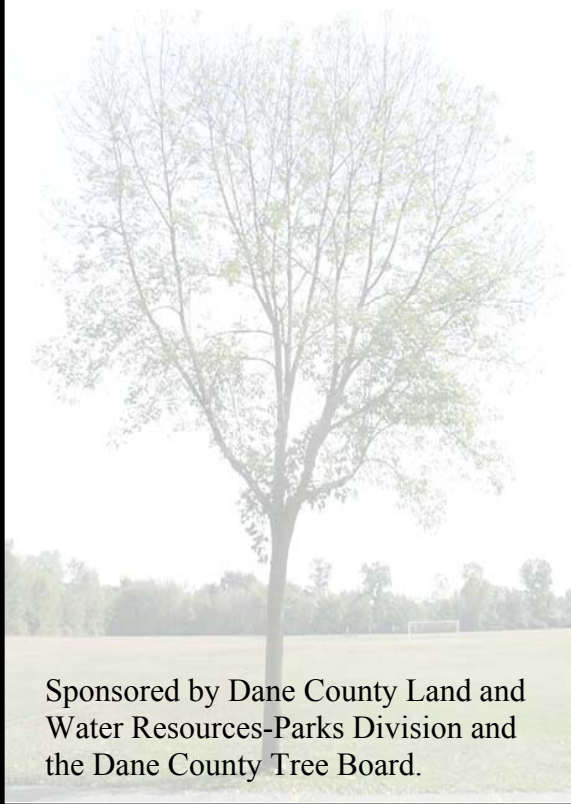
(grinder)

Appendix H: Template for EAB Doorhanger (Next Page)

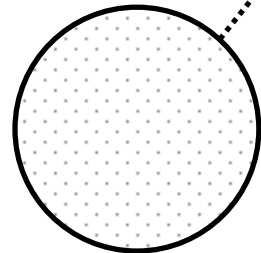


The Emerald Ash Borer has been found in Dane County.

Community leader: Summarize planned actions, recommendations, or options here.



Sponsored by Dane County Land and Water Resources-Parks Division and the Dane County Tree Board.



Be on the lookout!

Signs and symptoms of Emerald Ash Borer infestation include:

- Sprouting from the base or trunk
- Crown dieback
- Bark splitting
- S-shaped larval galleries
- Increased woodpecker activity
- D-shaped exit holes- 1/8" in diameter:



- Adult beetles-1/2" long



- Larvae under the bark



If you suspect you may have EAB in your ash trees, contact: *your contact here.*

Appendix I: Letter to Municipalities



Parks Division
Land & Water Resources Department
Anna J. Willow, Invasive Species Planner

September 18, 2008

Dear Local Official,

I am writing regarding Dane County's ongoing effort to develop a proactive countywide plan to manage the potential impacts of the emerald ash borer on our communities. Since January of this year, Dane County Parks has been working to develop a plan that will: 1) help mitigate the potential costs associated with emerald ash borer control efforts and 2) reduce the economic and environmental impacts of the emerald ash borer on local units of government and county proprieties. This planning process is enabled by an Urban Forestry Grant from the Wisconsin Department of Natural Resources. Partners in the planning process include the Dane County Tree Board, Wisconsin Department of Natural Resources, Wisconsin Department of Agriculture Trade and Consumer Protection, and local units of government.

It is critical that we receive input from all Dane County municipalities and that the unique needs of each community are taken into account in the planning process. One of the main objectives of this plan is the identification and assessment of safe disposal and wood utilization options for wood resources. We hope that each city, village, and town within the county will provide input.

In order to develop the most comprehensive plan possible, we are interested in any municipal tree inventory data you may have. Ideally, the data we receive will be in a GIS-compatible format (such as I-Tree, TreeWorks or ArborVue), but we are well aware that many municipalities do not have this type of data. We would be very grateful for any spreadsheets (Excel) or databases (Access) that describe your trees. In the absence of a formal tree survey, we are interested in any information about the ash trees (total number, percentage, and/or location) in your community.

Our next step involves identifying possible wood utilization sites within the county. As the enclosed spreadsheet shows, all Dane County municipalities contain trees that could potentially be damaged in storms or, in the case of ash, be impacted by the emerald ash borer. Ash is an important component of southern Wisconsin woodlands and, in many municipalities, accounts for between one-fifth and one-third of all residential trees. In

order to determine the best locations for the collection and utilization of emerald ash borer affected wood, storm damage, and other waste wood, we are also very interested in learning how much waste wood your municipality processes annually and how this material is currently handled. What percentage of this wood is chipped? Are there industries in your community that might be able to make productive use of this type of wood?

As you may already know, the emerald ash borer has recently been confirmed in Ozaukee and Washington Counties in southeastern Wisconsin. Since this invasive beetle was first discovered in the Detroit area in 2002, it has rapidly spread throughout Michigan, Ohio, and southern Ontario and is now established in Indiana, Illinois, and Pennsylvania. Ash trees in impacted communities have been devastated and the associated costs have been substantial. More information about the emerald ash borer can be found at emeraldashborer.wi.gov and at emeraldashborer.info.

Due to the urgency of the emerald ash borer issue, we would like to assemble this data as quickly as possible. We know that some communities are currently in the process of conducting their first tree inventories and management plans and that others are updating existing inventories and plans. Although the County Plan will be developed to accept this new information and future updates, we would like to receive any initial data you have by October 10th of 2008.

Thank you for your time and participation,

Anna J. Willow
Dane County Parks Invasive Species Planner
willow@co.dane.wi.us
(608) 224-3758

Pete Jopke
LWRD Project Management Coordinator
jopke@co.dane.wi.us
(608) 224-3733

Appendix J: Dane County Contacts for Urban Forestry Issues

Municipal Entity	Contact Title & Address	Phone
City of:		
Edgerton	Public Works Director, 12 Albion St., Edgerton, WI 53534	(608) 884-4811
Fitchburg	City Forester/Naturalist, 5520 Lacy Rd., Fitchburg, WI 53711	(608) 270-4289
Madison	City Forester, 1402 Wingra Creek Pkwy., Madison, WI 53715	(608) 266-4450
Middleton	City Forester, 7426 Hubbard Ave., Middleton, WI 53562	(608) 831-7479
Monona	Asst. Director of Public Works, 5211 Schlueter Rd., Monona, WI 53716	(608) 222-2525
Stoughton	Parks and Recreation Director, 321 S. 4 th St., Stoughton, WI 53589	(608) 873-6746
Sun Prairie	Parks, Recreation and Forestry, 2598 W. Main St., Sun Prairie, WI 53590	(608) 837-3449
Verona	Parks and Urban Forestry, 410 Investment Court, Verona, WI 53593	(608) 848-6809
Village of:		
Belleville	Public Works, 20 River St., Belleville, WI 53508	(608) 424-3341
Black Earth	Public Works, 1210 Mills St., P.O. Box 347, Black Earth, WI 53515	(608) 767-2063
Blue Mounds	Public Works, 11011 Brigham Ave. Box 189, Blue Mounds, WI 53517	(608) 437-5197
Brooklyn	Clerk, 102 N. Rutland Ave., Brooklyn, WI 53521	(608) 455-4201
Cambridge	Clerk, 200 Spring St., Cambridge, WI 53523	(608) 423-3712
Cottage Grove	Public Works, 221 E. Cottage Grove Rd., Cottage Grove, WI 53527	(608) 839-5813
Cross Plains	Clerk, 2417 Brewery Rd., Cross Plains, WI 53528	(608) 798-3241
Dane	Clerk, 102 W. Main St. Dane, WI 53529	(608) 849-5422
DeForest	Director, Parks & Recreation, 306 Deforest St., Deforest, WI 53532	(608) 846-6751
Deerfield	Public Works Director, Box 66, 4 N. Main St., Deerfield, WI 53531	(608) 764-5497
Maple Bluff	Public Works Director, 18 Oxford Place, Madison, WI 53704	(608) 244-3048
Marshall	Director of Public Works, 130 S. Pardee St., Marshall, WI 53559	(608) 655-3814
Mazomanie	Clerk, 133 Crescent St., Mazomanie, WI 53560	(608) 795-2100
McFarland	Public Works, 5115 Terminal Dr., McFarland, WI 53558	(608) 838-7287
Mount Horeb	Parks and Forestry, 301 Blue Mounds Street, Mount Horeb, WI 53572	(608) 437-7190
Oregon	Public Works Director, 117 Spring St., Oregon, WI 53575	(608) 835-6290
Rockdale	Clerk, 148 Water St., Rockdale, WI 53523	(608) 423-9694
Shorewood Hills	City Forester, 810 Shorewood Boulevard, Madison, WI 53705	(608) 267-2680
Waunakee	Parks Supervisor, 500 W. Main St., Waunakee, WI 53597	(608) 849-5874
Town of:		
Albion	Clerk, 624 Albion Rd., Edgerton, WI 53534	(608) 884-8974
Berry	Clerk, 9046 State Road 19, Mazomanie, WI 53560	(608) 767-4152
Black Earth	Clerk, 1704 Blue Mounds St., Black Earth, WI 53515	(608) 767-2447
Blooming Grove	Clerk, 1880 S. Stoughton Rd., Madison, WI 53716	(608) 223-1104
Blue Mounds	Clerk, 10560 Blue Rock Rd., Mt. Horeb, WI 53572	(608) 437-5311
Bristol	Clerk, 7747 Cty Rd. N, Sun Prairie, WI 53590	(608) 837-6494
Burke	Clerk, 4326 Portland Pkwy, Madison, WI 53714	(608) 825-8420
Christiana	Clerk, 974 Cty Rd. B, Cambridge WI 53523	(608) 423-3816
Cottage Grove	Highway/Public Works, 4062 Cty Rd. N, Cottage Grove, WI 53527	(608) 839-4767
Cross Plains	Clerk, 4204 Cty Rd. P, Cross Plains, WI 53528	(608) 798-0189
Dane	Clerk, 7202 Black Hill Rd., Lodi, WI 53555	(608) 849-7235
Deerfield	Clerk, 3611 Cty Rd. O, Cambridge, WI 53523	(608) 764-8054
Dunkirk	Clerk, 794 Collins Rd., Stoughton WI 53589	(608) 873-9177
Dunn	Public Works, 4156 Cty Rd. B, McFarland, WI 53558	(608) 255-4219
Madison	Public Works Foreman, 2120 Fish Hatchery Rd., Madison, WI 53713	(608) 210-7213
Mazomanie	Clerk, 5861 Voss Rd., Box 404, Mazomanie, WI 53560	(608) 795-2920
Medina	Clerk, 50 E. Waterloo Rd., Waterloo, WI 53594	(608) 655-3030
Middleton	Clerk, 7555 W. Old Sauk Rd., Verona, WI 53593	(608) 833-5887
Montrose	Clerk, 1341 Diane Ave., Belleville, WI 53508	(608) 424-3848
Oregon	Clerk, 1138 Union Rd., Oregon, WI 53575	(608) 835-3200
Perry	Clerk, 1004 State Rd. 78, Mt. Horeb, WI 53572	(608) 437-4553
Pleasant Springs	Clerk, 2354 Cty Rd. N, Stoughton, WI 53589	(608) 837-3063
Primrose	Clerk, 8762 Cty Rd. G, Mt. Horeb WI 53572	(608) 832-4471
Roxbury	Clerk, 9203 Cty Rd. Y Sauk City, WI 53583	(608) 643-4762

Rutland	Clerk, 4177 Old Stage Rd., Brooklyn, WI 53521	(608) 455-3925
Springdale	Clerk, 2379 Town Hall Rd., Mt. Horeb, WI 53572	(608) 437-6230
Springfield	Clerk, 6157 Cty Rd. P, Dane, WI 53529	(608) 849-7887
Sun Prairie	Clerk, 5556 Twin Lane Rd., Marshall, WI 53559	(608) 837-6688
Vermont	Clerk, 3776 Forshaug Rd., Mt. Horeb WI 53572	(608) 767-2555
Verona	Administrator, 335 N. Nine Mound Rd., Verona, WI 53593	(608) 845-7187
Vienna	Clerk, 6499 Beech Ct., Waunakee, WI 53597	(608) 846-3800
Westport	Clerk, 5387 Mary Lake Rd., Waunakee WI 53597	(608) 849-4372
Windsor	Superintendent of Streets/Parks, 4084 Mueller Rd., DeForest, WI 53532	(608) 846-3854
York	Clerk, 185 Hoene Rd., Columbus, WI 53925	(920) 623-0350